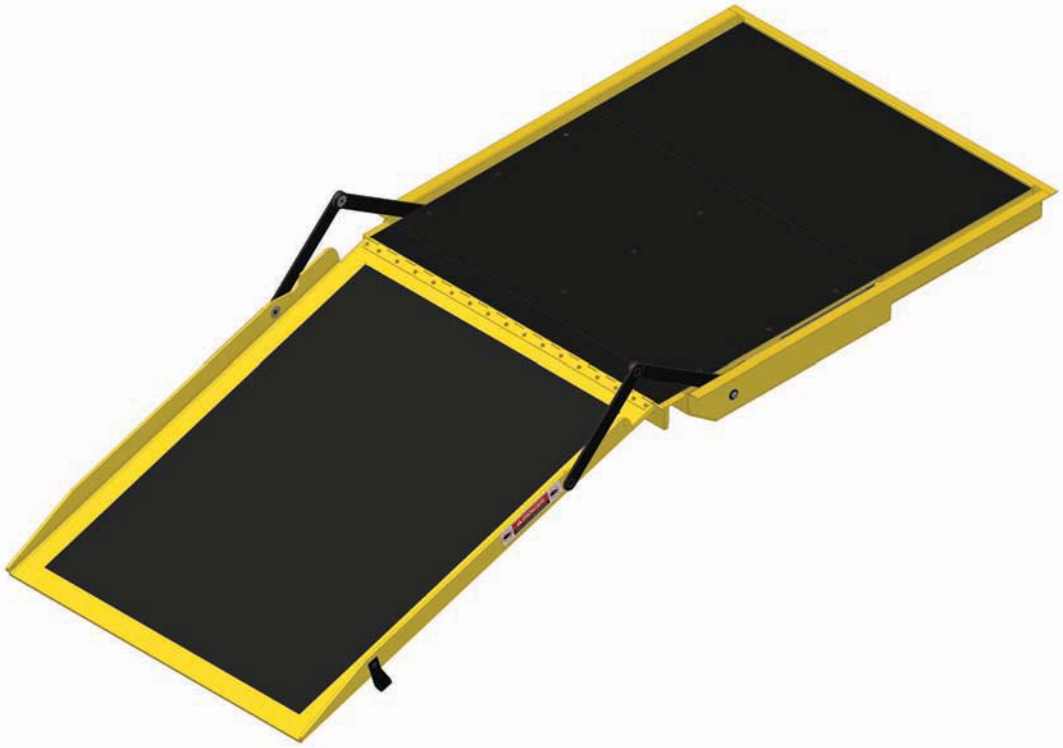
Operator's/Installation/Service Manual



Braun

Commercial

RA400 Transit Ramp

for Low-Floor Transit Vehicles

Model FF3248Y-24V

THE BRAUN CORPORATION®

"Providing Access to the World"®

International Corporate Hdqrs: P.O. Box 310 Winamac, IN 46996 USA

1-800-THE LIFT® (574) 946-6153 FAX: (574) 946-4670

WARNING
Manual
Read manual before operating, installing or servicing ramp. Failure to do so may result in serious bodily injury and/or property damage.

35168

November 2008

Braun RA400 Transit Ramp

Congratulations

We at The Braun Corporation wish to express our fullest appreciation on your new purchase.

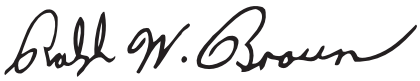
With you in mind, our skilled craftsmen have designed and assembled the finest ramp available.

This manual includes operating instructions, installation instructions, servicing instructions and instructions for troubleshooting, if needed.

Braun ramps are built for dependability and will provide years of service and mobility independence, as long as the ramp is installed and maintained as specified, and the ramp is operated by an instructed person.

Sincerely,

THE BRAUN CORPORATION



Ralph W. Braun
Chief Executive Officer

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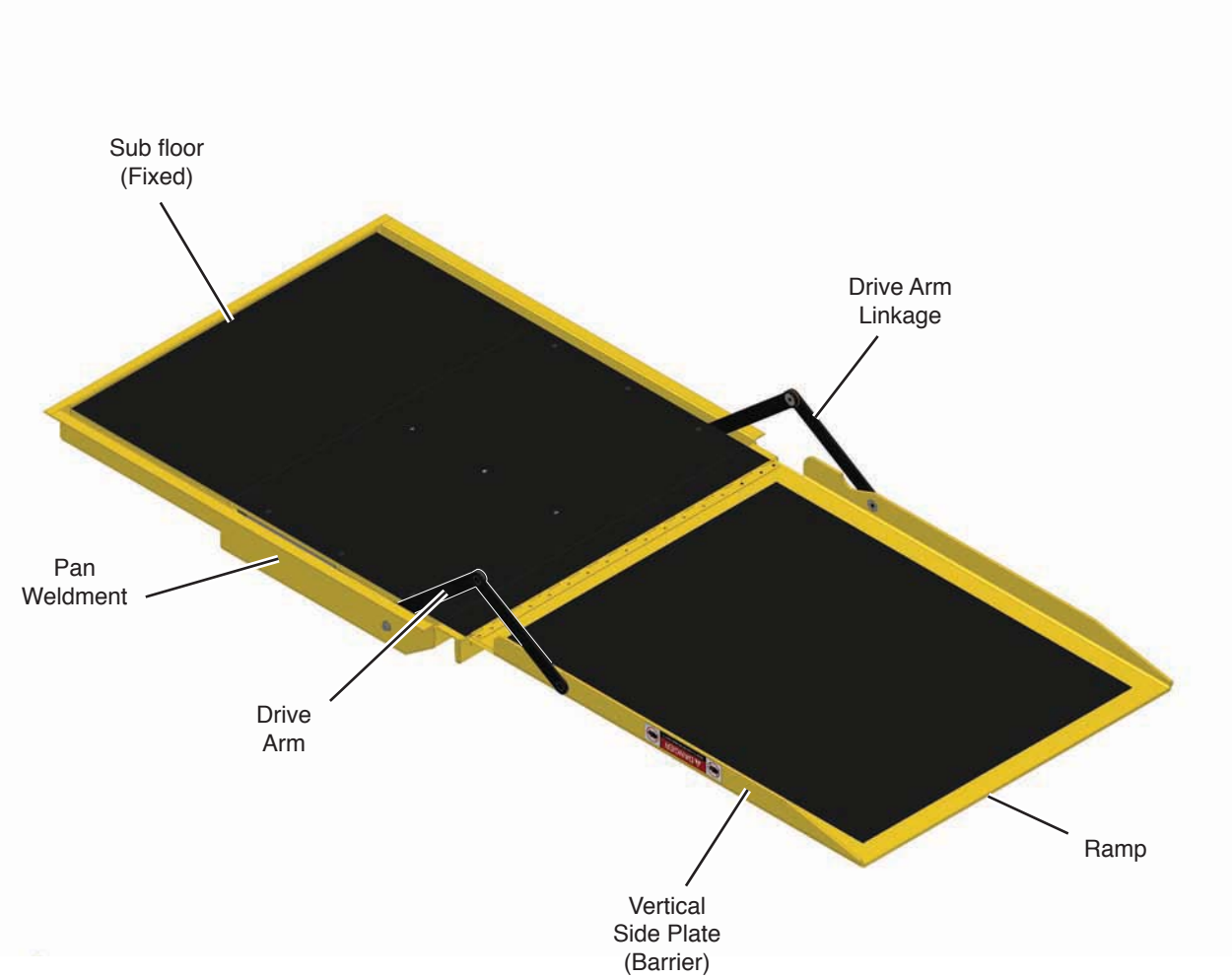
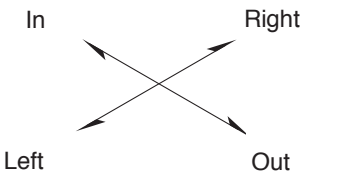
RAMP TERMINOLOGY

Ramp Terminology Illustration - FF3248Y-24V

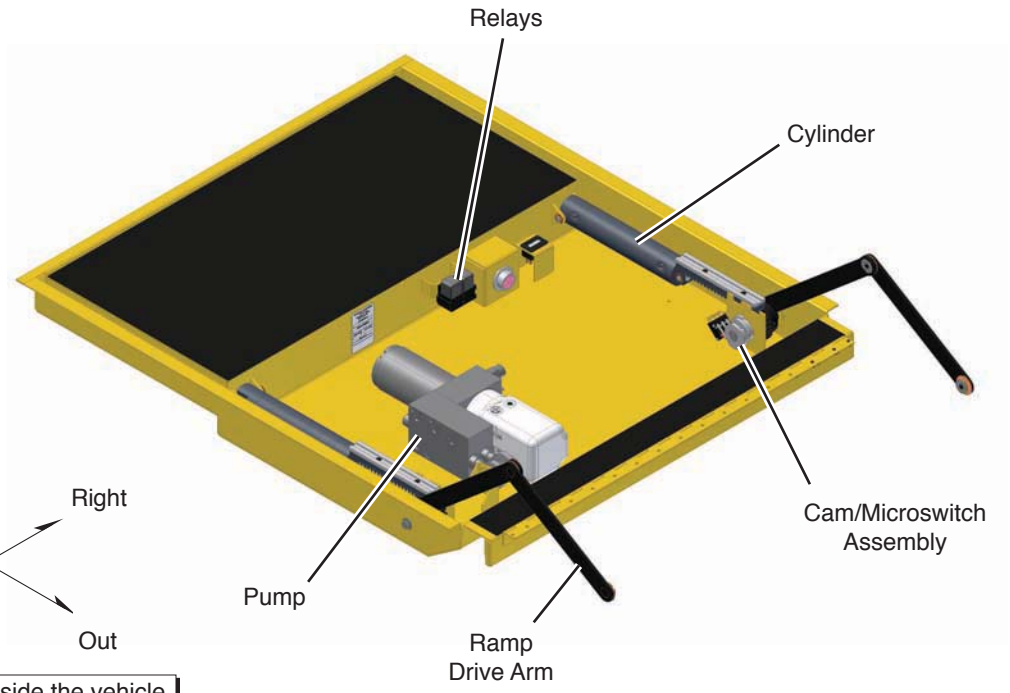
Refer to the illustration below and the illustrations on page 3 for identification of components and clarification of direction terminology.



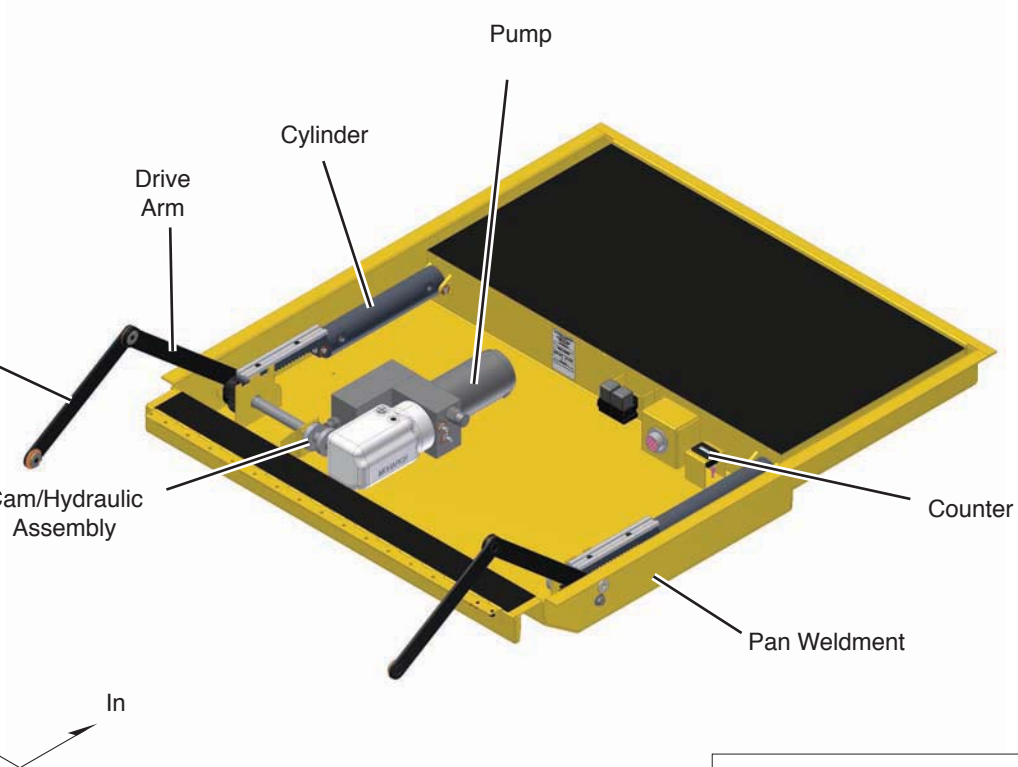


As viewed from outside the vehicle

Ramp Component Terminology Illustrations - FF3248Y-24V



As viewed from outside the vehicle



As viewed from outside the vehicle

Note: The sub floor, pan support structures and the ramp have been removed from these illustrations to provide a clear view of the internal components.

RAMP TERMINOLOGY

Introduction

Braun RA400 Series Transit Ramps (to be referred to as RA400 throughout this manual) are designed for use in low-floor transit vehicles. The RA400 provides vehicle access to people with disabilities (wheelchair passengers or standees using other type mobility aids). The commercial oriented ramp is ADA compliant (dependant upon installation height). See the Installation section for ADA specifications.

The self-contained “drop-in” unit requires no remote pump, external hydraulic lines or pre assembly. The hydraulic and electrical components are internal and easily accessible. A single electrical feed provides the power supply (24 volt), the ground, a ramp OUT signal (+), a ramp IN signal (+) and various indicator signals.

A “floor pocket” built into the chassis/floor system allows for simple installation (dimensional requirements specified in the Installation section).

The RA400 is specifically designed to be operated by an attendant. The ramp installer provides an appropriate control switch for the end user. Consequently, the operating instructions contained in this manual are generic due to the limitless variables.

The RA400 provides fully automatic operation of ramp functions. The electric/hydraulic system is controlled by two relays which activate the hydraulic pump in opposite directions for deploy and stow functions (powering dual-acting hydraulic cylinders). No sensitive electronic controls or sensors are required for operation.

All RA400 ramp models feature gravity down "drift" during the deploy cycle. When deploying the ramp, the motor stops running when the ramp reaches an approximate 45° angle. The ramp continues to slowly lower the remaining distance by the force of gravity. When stowing, the ramp folds inward until it's beyond the 45° shut off point, then gravity lowers the ramp to the pan.

The pressure relief valves built into the pump prohibit the ramp from lifting (raising) with approximately 20 pounds or more on the ramp.

Instructions are provided for manual operation of the ramp in event of power or equipment failure. See **Manual Override** on the following page for further details.

Read and become familiar with all operation safety precautions, operation notes and details, operating instructions and manual operating instructions before attempting operation.

Terminology: Become familiar with the terminology that will be used throughout this manual. Become familiar with the identification of RA400 components and their functions. Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT® if any of this information is not fully understood.

Direction: The terms “left”, “right”, “in” and “out” will be used throughout this manual to indicate direction (as viewed from the outside of the vehicle looking directly at the ramp). Refer to the Terminology Illustrations for clarification of direction terms.

RAMP TERMINOLOGY

Ramp Components

Refer to the Terminology Illustrations on pages 2 and 3.

Pan Weldment (Housing): The pan is the stainless steel casing mounted in the vehicle floor system which contains the hydraulic pump and electrical components that power the ramp electric/hydraulic systems. The fixed sub-floor cover protects the components from above. The cover is easily removed for access to drive components. The sub-floor provides an antiskid surface for entry and exit when the ramp is deployed. The RA400 stows (folds) onto the sub floor providing an unobstructed antiskid surface for entry and exit when the ramp is not in use.

Ramp Assembly: The ramp assembly is made of an aluminum ramp section. The ramp features vertical side plates and full antiskid surface.

Drive Arm Assembly: The cylinder driven drive arm assemblies deploy and stow the ramp assembly.

Ramp Actions and Functions

Deploy: Deploy is the action of the ramp assembly raising and unfolding (rotating) to ground level when the DEPLOY (OUT) switch* is activated (*installer supplied).

Stow: Stow is the action of the ramp assembly raising and folding (rotating) inward to stow position (floor level) when the STOW (IN) switch* is activated (*installer supplied).

Stow Position: Stow position is achieved when the ramp assembly is resting fully on the pan weldment (rotated inward and lowered fully).

Manual Override: Manual operation is achieved without the use of any mechanical release or complicated procedures. Simply manually deploy or stow the ramp assembly. A strap is provided on the ramp to manual deploy the ramp from the stowed position. Minimal physical effort is required to route the hydraulic fluid through the system. Slow steady motion results in the least resistance and easy operation. The faster you attempt to manually operate the ramp, the greater the resistance. See Ramp Manual Operation on page 11 for further details.

RAMP OPERATION

Safety Symbols

SAFETY FIRST! Know That....

A All information contained in this manual and supplements (if included), is provided for your safety. Familiarity with proper operation instructions as well as proper maintenance procedures are necessary to ensure safe, trouble free operation. Safety precautions are provided to identify potentially hazardous situations and provide instruction on how to avoid them.

B

⚠WARNING

This symbol indicates important safety information regarding a potentially hazardous situation that could result in serious bodily injury and/or property damage.

C

⚠CAUTION

This symbol indicates important information regarding how to avoid a hazardous situation that could result in minor personal injury or property damage.

D **Note:** Additional information provided to help clarify or detail a specific subject.

These symbols will appear throughout this manual. **Recognize the seriousness of this information.**

Ramp Operation Safety Precautions

⚠WARNING

If the ramp operating instructions, manual operating instructions and/or ramp operation safety precautions are not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

⚠WARNING Read manual and supplement(s) before operating ramp. Read and become familiar with all safety precautions, operation notes and details, operating instructions and manual operating instructions before operating the ramp. **Note:** All transit agency personnel (drivers and ramp attendants) must read and become familiar with the contents of this manual and supplement(s) before operation.

⚠WARNING Load and unload on level surface only.

⚠WARNING Engage vehicle parking brake before operating ramp.

⚠WARNING Provide adequate clearance outside the vehicle to accommodate the ramp before opening lift door(s) or operating ramp.

⚠WARNING Inspect ramp before operation. Do not operate ramp if you suspect lift damage, wear or any abnormal condition.

⚠WARNING Keep operator and bystanders clear of area in which the ramp operates.

⚠WARNING Load and unload clear of vehicular traffic.

⚠WARNING Open ramp door(s) fully and secure before operating ramp.

⚠WARNING Do not overload or abuse.

Ramp Operation Safety Precautions (continued)

⚠WARNING Do not activate control switch(es) when anyone is near the area in which ramp operates.

⚠WARNING It is the responsibility of the attendant to oversee and assist ramp passengers.

⚠WARNING The wheelchair passenger and/or attendant must ensure the ramp is fully deployed before exiting the vehicle.

⚠WARNING Attendants must never operate the vehicle, the ramp or attend to passengers if intoxicated.

⚠WARNING Intoxicated passengers should not be allowed to board the vehicle.

⚠WARNING Wheelchair passengers must position and secure (buckle, engage, fasten, etc.) the wheelchair-equipped occupant seat belt before loading onto the ramp.

⚠WARNING Be aware of the ramp slope (angle).

⚠WARNING Wheelchair passengers should not raise front wheelchair wheels (pull wheelie) when on the ramp.

⚠WARNING The wheelchair must be positioned in the center of the ramp when loading and unloading.

⚠WARNING Keep ramp owner's manual in ramp-mounted vehicle at all times.

⚠WARNING Maintenance and lubrication procedures must be performed as specified in this manual by authorized (certified) service personnel.

⚠WARNING Never modify (alter) a Braun Corporation ramp.

⚠WARNING Do not use accessory devices not authorized by The Braun Corporation.

⚠WARNING Do not remove any guards or covers.

⚠WARNING If the information contained in this manual is not fully understood, contact The Braun Corporation immediately.

⚠WARNING Failure to follow these safety precautions may result in serious bodily injury and/or property damage.

RAMP OPERATION

Operation Notes and Details

The RA400 Ramp provides vehicle access to people with disabilities (wheelchair passengers or standees using other type mobility aids). The commercial oriented RA400 Ramp is operated by the transit vehicle driver/attendant. Unless your transit agency has a published policy stating that driver/attendants do not aid ramp passengers, **safe entering and exiting of ramp passengers is the responsibility of the driver/attendant**.

As stated in the Ramp Operation Safety section, all information in this manual is provided for the safety of passengers, attendants and bystanders. **Recognize the seriousness of this information.**

Read and become familiar with all ramp operation safety precautions, operation notes and details, operating instructions and manual operating instructions before attempting ramp operation procedures or assisting ramp passengers boarding and exiting the vehicle.

Ramp Access Doors and Interlocks

Attendants must become familiar with the vehicle ramp access door system and interlock(s), as well as the proper operation of the ramp.

Vehicle ramp access door configurations and operation procedures vary. Ensure the ramp door is fully open before activating the ramp (an interlock typically prevents ramp operation unless the door is fully open). Attendants and passengers must keep clear of the area in which the power door operates. Ensure the path is clear before closing the door. Be sure the door is fully closed before attempting to drive the vehicle (interlocks typically ensure this).

Interlocks are required by nearly all transit authorities. Vehicle interlocks typically prevent vehicle motion if the ramp is not stowed. In some cases, the ramp cannot be operated if interlock conditions are not met. Interlock requirements may include: the vehicle transmission must be engaged in Park, the parking brake must be engaged, the ramp access door must be fully open and/or others. Multiple interlocks may exist.

Instructions for operation of interlocks and door systems will not be addressed in this manual due to the variety of procedures required for operating them.

General instructions for safe operation of the ramp are provided. Ramp safety and ramp passenger safety information is included. **It is the responsibility of the attendant** to properly open and close the ramp access door(s), to activate interlock(s), to properly activate the ramp power functions as well as assist ramp passengers.

Do not operate the ramp if you suspect ramp damage, wear or any abnormal condition. Discontinue use immediately and contact The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect the ramp.

Operation Procedure Review

The Braun Corporation recommends that transit agency supervisors and driver/attendants review the safety precautions and operation procedures appearing in this manual with the ramp sales representative (or vehicle converter) **before** attempting ramp operation.

Any questions or concerns can be answered at that time. Operate the ramp through all functions to ensure the proper use and operation is understood.

Transit agency supervisors should train and educate all driver/attendants on the proper use and operation of the vehicle, door system, interlock(s), ramp and ramp passenger safety.

The ramp owner's/service **manual must be stored in the ramp-equipped vehicle at all times**.

⚠WARNING

Read and become familiar with all ramp operation safety precautions, operation notes and details, operating instructions and manual operating instructions prior to operating the ramp. If this information is not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

Preventive Maintenance

Maintenance is necessary to ensure safe and trouble free operation. General preventive maintenance consisting of **careful** inspections and cleaning the ramp system should be a part of your transit agency's daily service program. Simple inspections can detect potential operational problems.

Keeping the ramp assembly and housing area clean is one of the most effective preventive maintenance practices to exercise. Dirt, mud, snow, ice and other debris can cause ramp problems.

Regular preventive maintenance will reduce potential operation downtime and increase the service life of the ramp, as well as possibly detecting potential hazards.

Exposure to harsh weather, environmental conditions, or heavy usage may require more frequent maintenance and lubrication procedures.

Preventive maintenance visual inspections **do not** take the place of the procedures specified in the Maintenance and Lubrication Schedule provided in this manual. Refer to the Maintenance and Lubrication section in this manual for further details.

RAMP OPERATION

Ramp Power Operation

The power ramp is attendant operated and activated by the control switch provided by the vehicle converter (ramp installer). A momentary contact ramp control switch (center off) will typically be provided near the driver. The control switch may be part of a panel providing other features and controls (power on/off indicators, LED's, etc.).

Before operating the ramp, park the vehicle on a level area, away from vehicular traffic. Place the vehicle transmission in "Park" and engage the parking brake. Meet all other interlock conditions (as equipped). Activate the vehicle "kneel" system to lower the vehicle (if so equipped). Lowering the vehicle reduces the slope of the ramp.

Power Ramp Safety

⚠WARNING

Provide adequate clearance outside of vehicle to accommodate ramp. Failure to do so may result in serious bodily injury and/or property damage.

Be certain there is adequate clearance outside the vehicle before deploying the power ramp.

The ramp operator (attendant) and bystanders must keep clear of the area in which the ramp operates and clear of all moving parts. Attendants must ensure that passengers keep clear of the area in which the ramp operates. Do not attempt to grip or hold the ramp or ramp drive arm assemblies.

If you are an attendant operating the ramp, it is your responsibility to oversee and/or assist in performing safe passenger loading and unloading procedures. Observe your passengers at all times when they are entering and exiting the vehicle. Attendants must be aware of any special needs and/or procedures required for safe transport of wheelchair passengers.

Do not attempt to load or unload a passenger in a wheelchair or other apparatus that does not fit on the ramp. Do not exceed the load capacity of the ramp. Passengers should enter and exit one at a time. The attendant should not board the ramp with the passenger except when assistance is required and the load capacity is not exceeded. Always return the ramp to the stowed position when not in use.

Gravity Down Drift

Deploy Gravity Down Drift:

When deploying (unfolding) the ramp, the ramp pump motor stops running when the ramp reaches an approximate 45° angle (shut off point). The ramp continues to slowly lower the remaining distance by the force of gravity (non-powered).

Allow the ramp to unfold (deploy) fully before boarding the ramp. Forcing the ramp out or down during the deploy (unfold) function, or boarding onto the ramp before it is fully-deployed **may result in damage** to the ramp and/or drive assembly.

Stow Gravity Down Drift:

When stowing the ramp and it reaches an approximate 45° angle (shut off point), gravity lowers the ramp to the pan (floor).

Note: Pump motor shut off points are microswitch adjustable.

⚠CAUTION

Allow ramp to deploy fully before boarding. Failure to do so may result in damage.

Ramp Manual Operation

If you experience power or equipment failure, the ramp can be manually stowed and deployed. The RA400 ramp must be manually operated by an attendant.

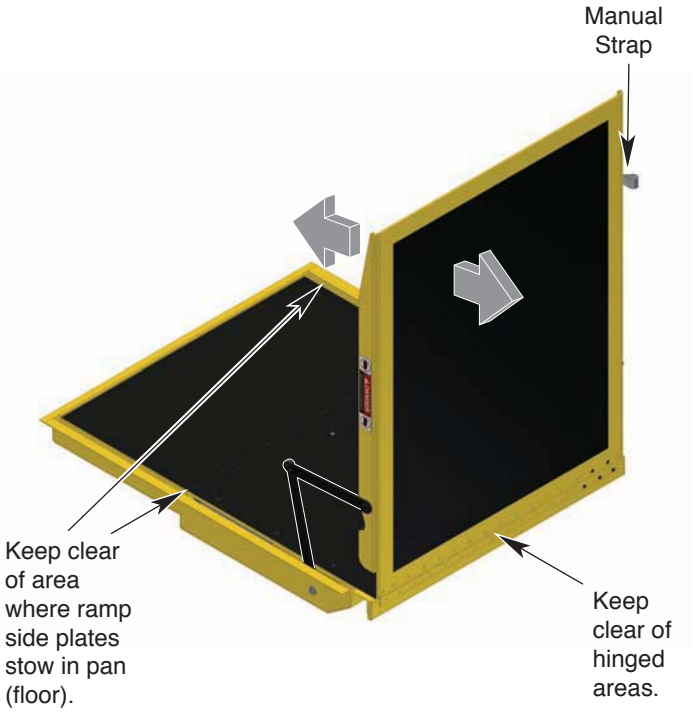
A manual strap is provided on the right side of the ramp (see Figure A). The manual strap is provided to begin manual operation of the ramp from the stowed position. **Carefully** deploy and stow the ramp manually.

Keep clear of the area in which the hinged RA400 ramp section stows and deploys. Keep clear of the area where the ramp side plates stow in the pan (floor). Keep clear of the drive arms. Remember to use good body mechanics when stowing and deploying the ramp.

The safety precautions addressed in the Ramp Power Operation section apply to manual operation of the ramp also. **Read and become familiar with all ramp safety precautions**.

Note: Minimal physical effort is required to manually operate the ramp. Slow steady motion results in the least resistance and easy operation. The faster you attempt to manually operate the ramp, the greater the resistance.

Figure A



Carefully deploy and stow the ramp.

Ramp Passenger Safety

Unless your transit agency has a published policy stating that driver/attendants do not aid ramp (disabled) passengers, **it is the responsibility of the driver/attendant to ensure that ramp passengers enter and exit the vehicle on the ramp in the safest manner.**

ADA requirements state that transit drivers/attendants **must** assist with attaching and removing wheelchair and occupant restraint belts.

Ramp passengers (wheelchair passengers and standees), and attendants must use common sense and good judgment regarding ramp safety. Each wheelchair passenger (or standee) has a unique set of physical abilities combined with the physical characteristics of his or her wheelchair (or other mobility aid) that dictate the method in which he or she will enter and exit the vehicle.

Wheelchair attendants should be instructed on any special needs and/or procedures required for safe transport of wheelchair passengers. Follow all safety instructions regarding torso restraints, stability, balance, weight distribution and use of attendants as specified in the owner's manual supplied with the passenger's wheelchair (or other mobility aid). Wheelchair passengers must determine, establish and practice ramp boarding and exiting procedures under the direction of the their personal health care professional and wheelchair representative. Those procedures should be conveyed to the ramp attendant. Know your passengers abilities and needs for **optimum safety**.

Attendants must never operate the vehicle, the ramp or assist passengers if intoxicated. Intoxicated passengers should not be allowed to board or exit the vehicle.

Ramp Passenger Safety (Continued)

⚠WARNING

Position and fasten the wheelchair-equipped occupant seat belt before loading onto the wheelchair ramp. Failure to do so may result in serious bodily injury and/or property damage.

Passengers should be positioned in the center of the ramp at all times. Attendants and ramp passengers must be able to clearly view the ramp whenever boarding and exiting the vehicle. The attendant and/or wheelchair passenger must ensure the ramp is fully deployed before exiting the vehicle. Observe your passengers at all times when they are entering and exiting the vehicle.

Wheelchair-Equipped Occupant Seat Belts: Wheelchair passengers should position and buckle their wheelchair-equipped seat belt (torso restraint), as specified by the manufacturer, **before** loading onto a wheelchair ramp.

Different types of disabilities require different types of wheelchairs and different types of wheelchair-equipped occupant restraint belt systems (torso restraint). It is the responsibility of the wheelchair passenger to have his or her wheelchair equipped with an occupant restraint (seat belt) under the direction of their health care professional.

Stabilizing Wheelchairs: Powered and manual wheelchairs are designed to remain upright and stable during normal operation. All activities which involve movement in a wheelchair have an effect on the combined center of gravity of the occupant and wheelchair. Be aware of the ramp slope (angle). The slope of the ramp has a direct effect on the center of gravity. The wheelchair passenger's center of gravity and their ability to maintain stability and balance must be kept in mind by the wheelchair passenger and the attendant.

The aid of an attendant stabilizing the wheelchair is recommended for **optimum safety**. Wheelchair passengers who are unable to maintain stability and balance should not board a ramp without assistance. Counterbalance devices (anti-tippers) may be available from the wheelchair representative to enhance stability and balance.

Wheelchairs should be operated at a slow and constant speed when on the ramp. Wheelchairs should not accelerate suddenly when on the ramp. Wheelchair passengers should not raise the front wheelchair wheels (pull wheelie) when on the ramp.

Wheelchair passengers who intend to enter and exit the vehicle without the assistance of an attendant must determine the safest and most practical method and orientation of entering and exiting based on the physical characteristics of their personal wheelchair and his or her physical capabilities to maintain stability while the wheelchair is in motion on the ramp.

Wheelchair Attendants: When assisting a wheelchair occupant, remember to use good body mechanics. When the wheelchair is on the ramp, the attendant must grasp the push handles (or other) securely. Detachable wheelchair parts such as arms or leg rests must never be used for hand holds or lifting supports. Doing so could result in the parts being inadvertently detached from the wheelchair **resulting in possible injury to the wheelchair occupant and/or the attendant**.

Safety Symbols

SAFETY FIRST! Know That....

A All information contained in this manual and supplements (if included), is provided for your safety. Familiarity with proper operation instructions as well as proper maintenance procedures are necessary to ensure safe, trouble free operation. Safety precautions are provided to identify potentially hazardous situations and provide instruction on how to avoid them.

B

⚠WARNING

This symbol indicates important safety information regarding a potentially hazardous situation that could result in serious bodily injury and/or property damage.

C

⚠CAUTION

This symbol indicates important information regarding how to avoid a hazardous situation that could result in minor personal injury or property damage.

D **Note:** Additional information provided to help clarify or detail a specific subject.

These symbols will appear throughout this manual. **Recognize the seriousness of this information.**

Installation / Service Safety Precautions

⚠WARNING

If installation, maintenance or repair procedures cannot be completed exactly as provided in this manual or if the instructions are not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

⚠WARNING Read this manual and supplement(s) before performing installation, operation or service procedures.

⚠CAUTION Installation specifications and dimensions must be met.

⚠WARNING Remove any obstructions within the ramp mounting/operating area prior to beginning installation procedures.

⚠WARNING Do not operate ramp prior to positive securement of the pan.

⚠WARNING Check for obstructions such as gas lines, wires, exhaust, etc. before drilling or cutting during installation procedures.

⚠WARNING Route all cables clear of exhaust system, other hot areas, moving parts, wet areas, etc.

⚠WARNING Risk of electrical shock or fire! Use extra care when making electrical connections. Connect and secure as outlined in Installation Instructions and Wiring Diagrams.

⚠WARNING Maintenance and repairs must be performed only by authorized service personnel.

⚠WARNING Perform maintenance and lubrication procedures exactly as outlined in the Maintenance and Lubrication Schedule contained in this manual.

⚠WARNING Disconnect the power cable at the battery prior to servicing.

Installation/Service Safety Precautions (Continued)

⚠WARNING Keep hands, arms and all other body parts clear of moving parts.

⚠WARNING Never modify (alter) a Braun Corporation ramp.

⚠WARNING Replacement parts must be Braun authorized replacements.

⚠WARNING Never install screws or fasteners (other than factory equipped).

⚠WARNING Whenever replacing a hydraulic cylinder or seals, deploy ramp fully.

⚠WARNING Failure to follow these safety precautions may result in serious bodily injury and/or property damage.

Installation Requirements

Braun RA400 Series ramps must be installed and serviced by a Braun authorized service representative who has attended and been certified by The Braun Corporation Sales and Service School for Braun Mobility Products.

Read and become familiar with the operating instructions and the installation instructions contained in this manual before beginning installation, operation or service procedures.

⚠WARNING

Read this manual, before performing installation, operation or service procedures. Failure to do so may result in serious bodily injury and/or property damage.

Chassis Requirements

The RA400 is designed for use in low-floor transit vehicles. A "floor pocket" (mounting hole) built into the chassis/floor system allows for simple installation (accepts "drop-in" unit). The **Floor Pocket Clear Opening Dimensions** are specified on pages 15 and 16. See Figure B.

The ramp installer must provide an appropriate framework in the applicable location in the vehicle (aligned center with passenger door opening). Ramp assembly mounting hardware and/or brackets are directly dependant upon the vehicle chassis and "floor pocket" configuration (not supplied).

Outboard Support Tube: An outboard support tube must be positioned under the outboard edge of the opening (minimum 1-1/2" x 2" steel tube). See Figure B.

Kneeling Vehicles: This dimension measured with suspension lowered.

ADA: Installations with the support tube positioned higher than 12" above ground level may not comply with ADA ramp slope requirements.

Some OEM chassis meet these specifications. The RA400 was designed to conform to these specifications.

The ramp pan horizontal border (lip) sets on the floor pocket perimeter, (framework, sub floor, etc.). The finished flooring can be cut to conform to the border of the pan for a flush transition surface from ramp-to-floor.

Door Opening: Open the door(s) **fully** and check the clear door opening width dimension. **Specified minimum clear door opening width must be provided**). See Figure D.

Door(s) **must open outward**. When closed, the door(s) should align with and conform to the outboard edge of the ramp pan (rubber seal on bottom of door).

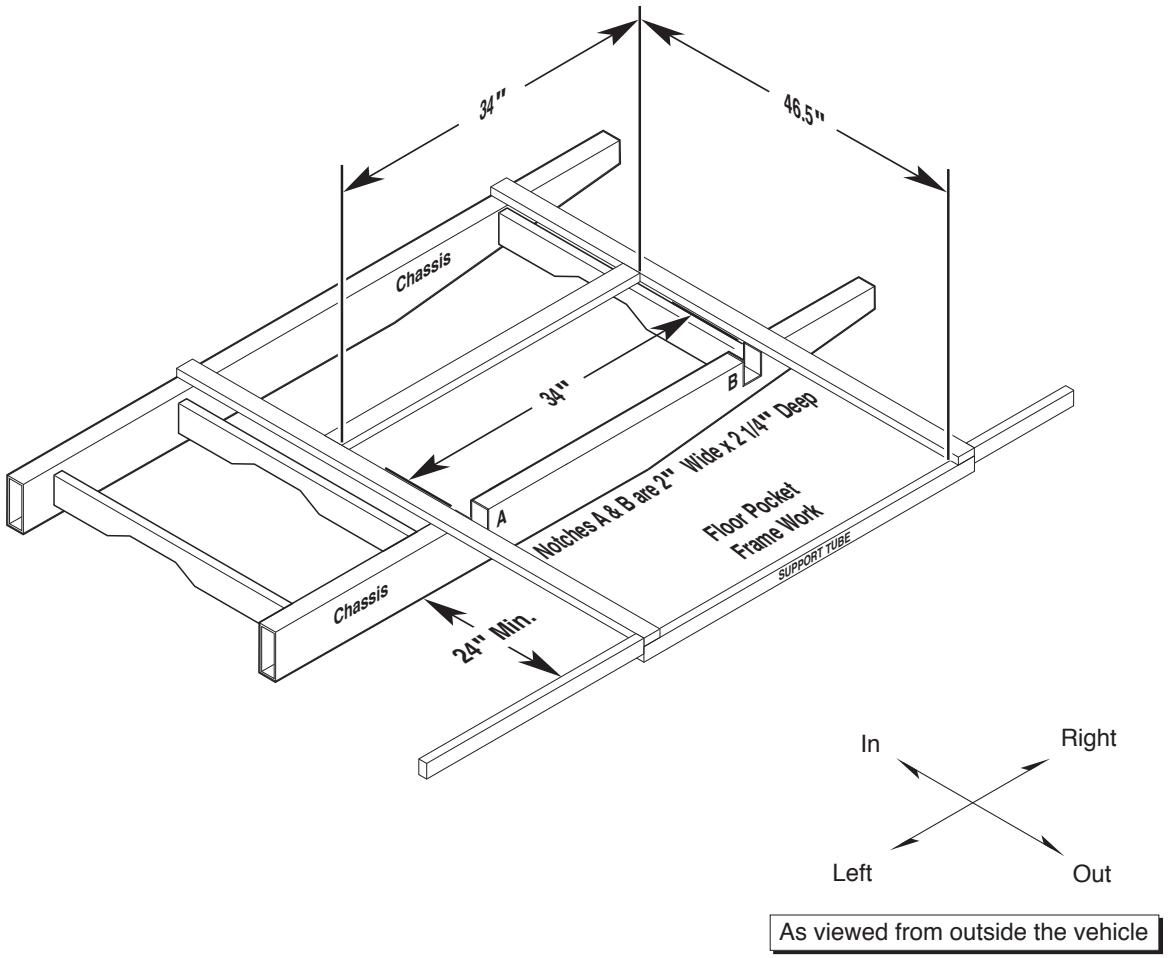
Minimum Clear Door Opening Dimensions are defined as finished door opening, including any intrusive door jambs, headers, sills or hinges.

Obstructions: Any intrusive obstructions within the door opening or the ramp mounting/operating area (such as seats, molding, lights, brackets, etc.) **must be removed**. Trim or molding that creates an uneven mounting surface should be removed. The molding can be modified to fit around the ramp pan horizontal border (lip).

There **must be a minimum 1/8" clearance between the deployed ramp assembly and the vehicle floor or any obstruction** on the floor (such as a rubber sill or threshold).

"Floor Pocket" Support Structure

Figure B



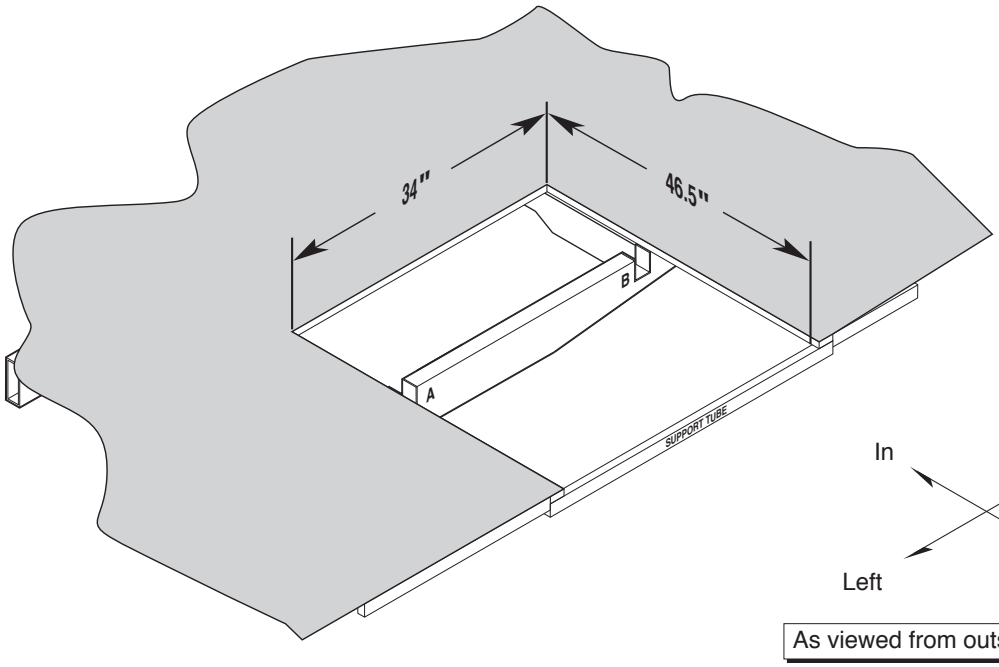
As viewed from outside the vehicle

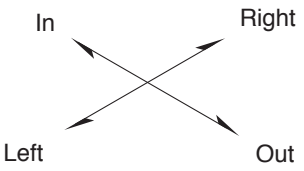
Vehicle chassis "floor pocket" configuration **must be aligned center** with door opening.

Door(s) **must open outward**.

"Floor Pocket" Clear Opening Dimensions

Figure C



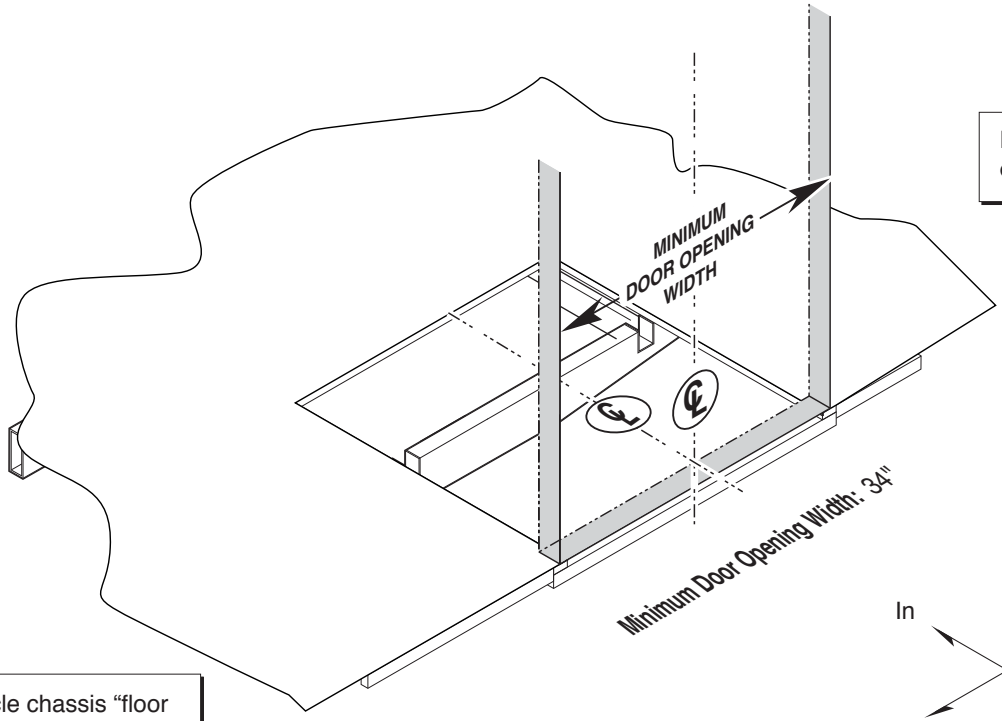


As viewed from outside the vehicle

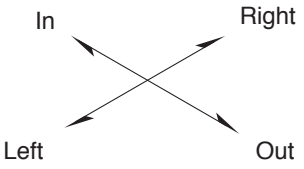
Clear Door Opening Width Dimension

Figure D

Door(s) **must open outward**.



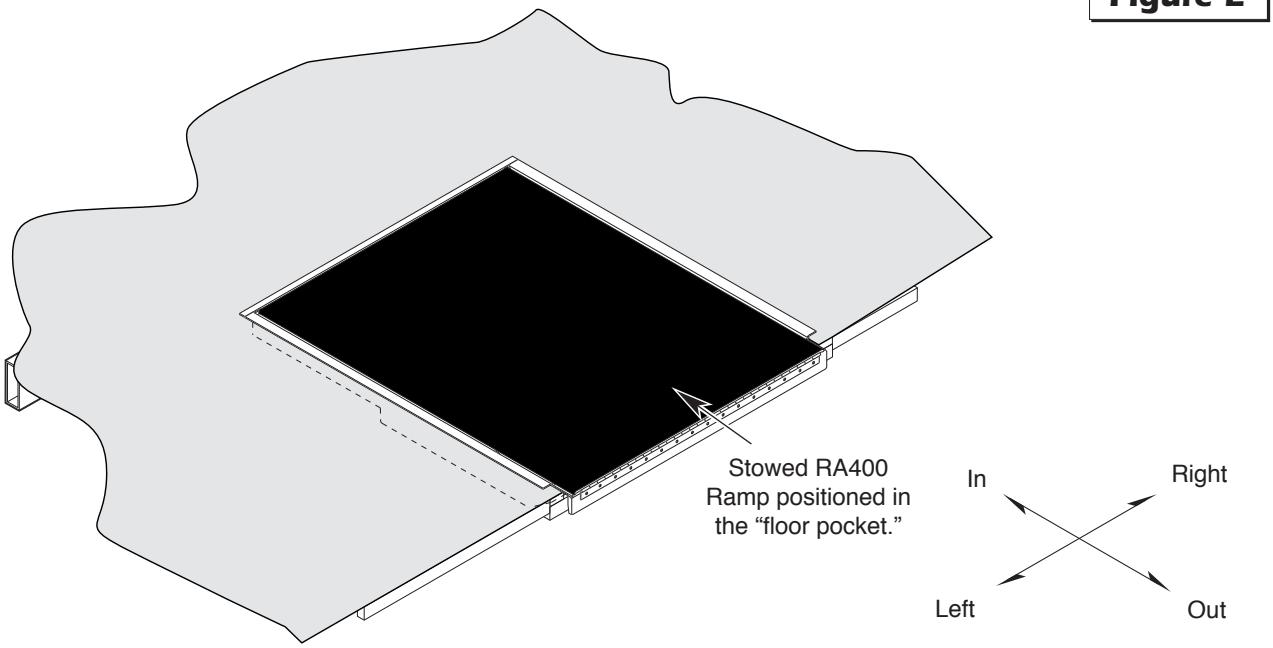
Vehicle chassis “floor pocket” configuration **must be aligned center** with door opening.



As viewed from outside the vehicle

Installed Ramp -Stowed

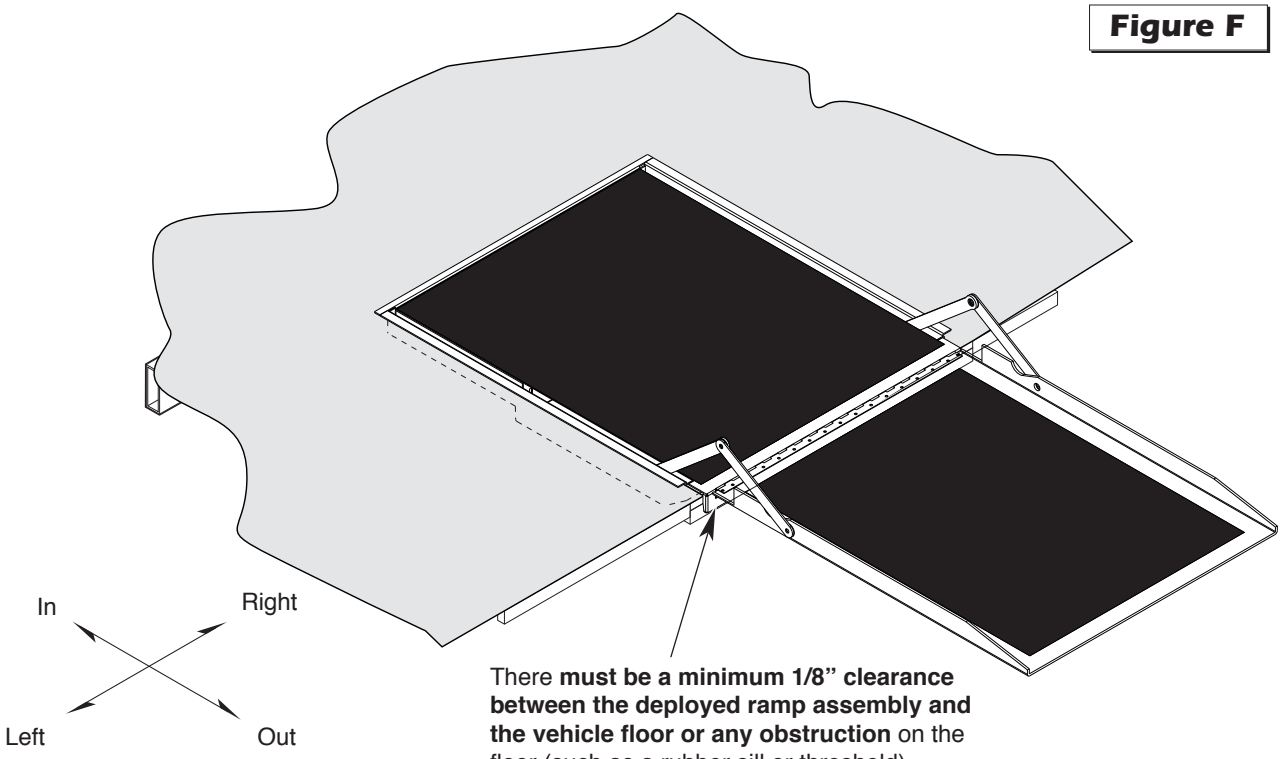
Figure E



As viewed from outside the vehicle

Installed Ramp - Deployed

Figure F


In
Right
Left
Out
There **must be a minimum 1/8” clearance between the deployed ramp assembly and the vehicle floor or any obstruction** on the floor (such as a rubber sill or threshold).

As viewed from outside the vehicle

Electrical Connections

An 8-pin Deutsch connector is mounted at the back of the RA400 ramp. A mating connector (male plug) is supplied with the ramp. The power supply (24 volt), the ground, a ramp OUT signal (+) and a ramp IN signal (+) must be terminated in the supplied Deutsch connector.

The ramp installer provides an appropriate control switch for the end user. A momentary contact ramp control switch (center off) will typically be mounted near the driver. The control switch may be part of a panel providing other features and controls (power on/off indicators, LED's, etc.).

Make electrical connections as shown in Figure H page 19. Strip wires, crimp and install contacts as specified in instructions supplied with 8-pin Deutsch connector.

⚠WARNING

Route cables clear of exhaust system, other hot areas and moving parts. Failure to do so may result in serious bodily injury and/or property damage.

The Positive (+) "battery" lead wire **must be protected by an in-line 25 ampere fuse or circuit breaker** (installer provided).

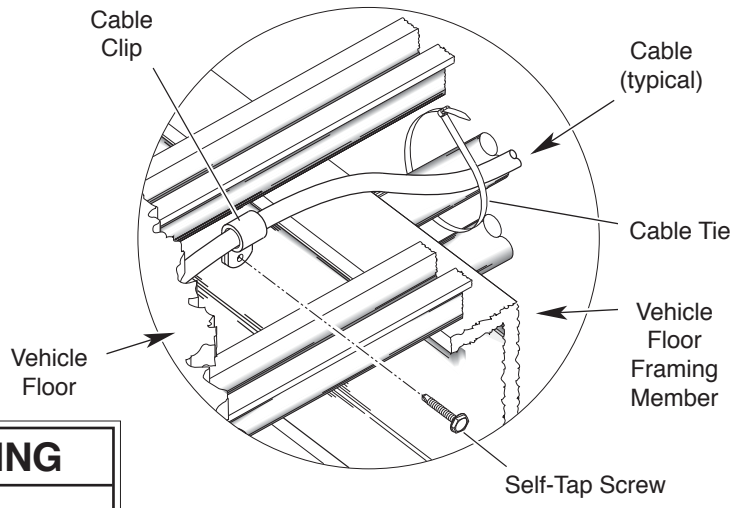
Do not connect the power "battery" lead wire to the battery until all other connections are made.

Connect the 8-pin Deutsch male plug to the mating Deutsch connector mounted at the back of the pan.

Carefully connect the power "battery" lead wire to the Positive (+) battery post.

Figure G

Secure all cables using cable ties and/or cable clips (mount clips with self-tap screws).



⚠WARNING

Risk of electrical shock! Use extra care when making electrical connections.

⚠WARNING

Risk of electrical fire! Use extra care when making electrical connections.

Chassis Ground Corrosion: When mounting chassis ground cables, remove undercoating, dirt, rust, etc. from the framing member around the mounting holes. Apply a protective coating to mounting holes to prevent corrosion. Apply grease to ground cable terminals and mounting hardware. **Failure to do so will void warranty of certain electrical components**.

Electrical Connection Illustration

An 8-pin Deutsch connector (male plug) is supplied with the ramp.

The ramp installer provides an appropriate momentary contact control switch.

Terminate the power supply, ground, ramp OUT signal and ramp IN signal as specified in legend.

The Positive (+) "battery" lead wire **must be protected by an in-line 25 ampere fuse or circuit breaker** (installer provided).

⚠WARNING

Positive (+) battery lead wire must be protected by installer-provided 25 ampere fuse or circuit breaker. Failure to do so may result in serious bodily injury and/or property damage.

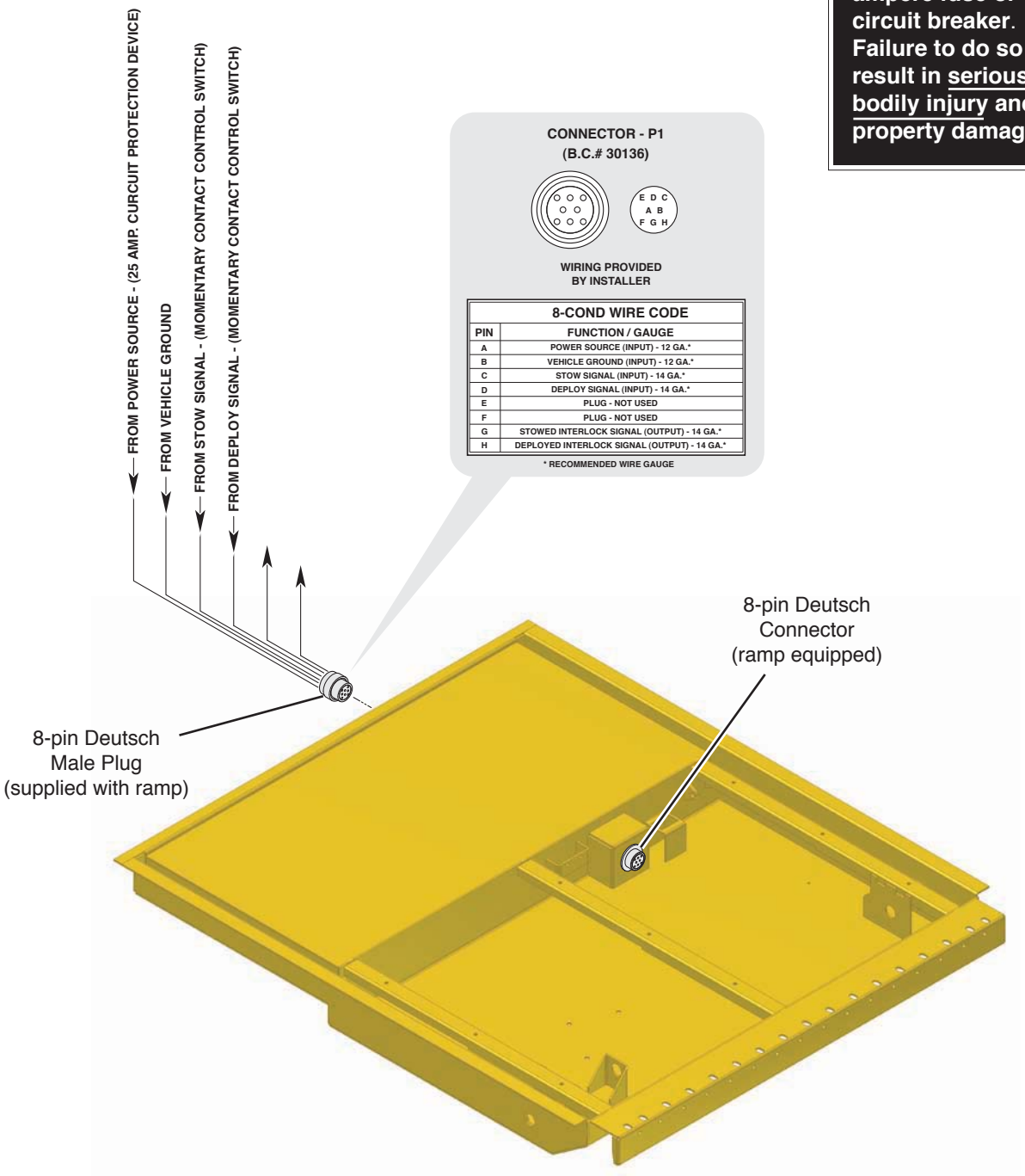
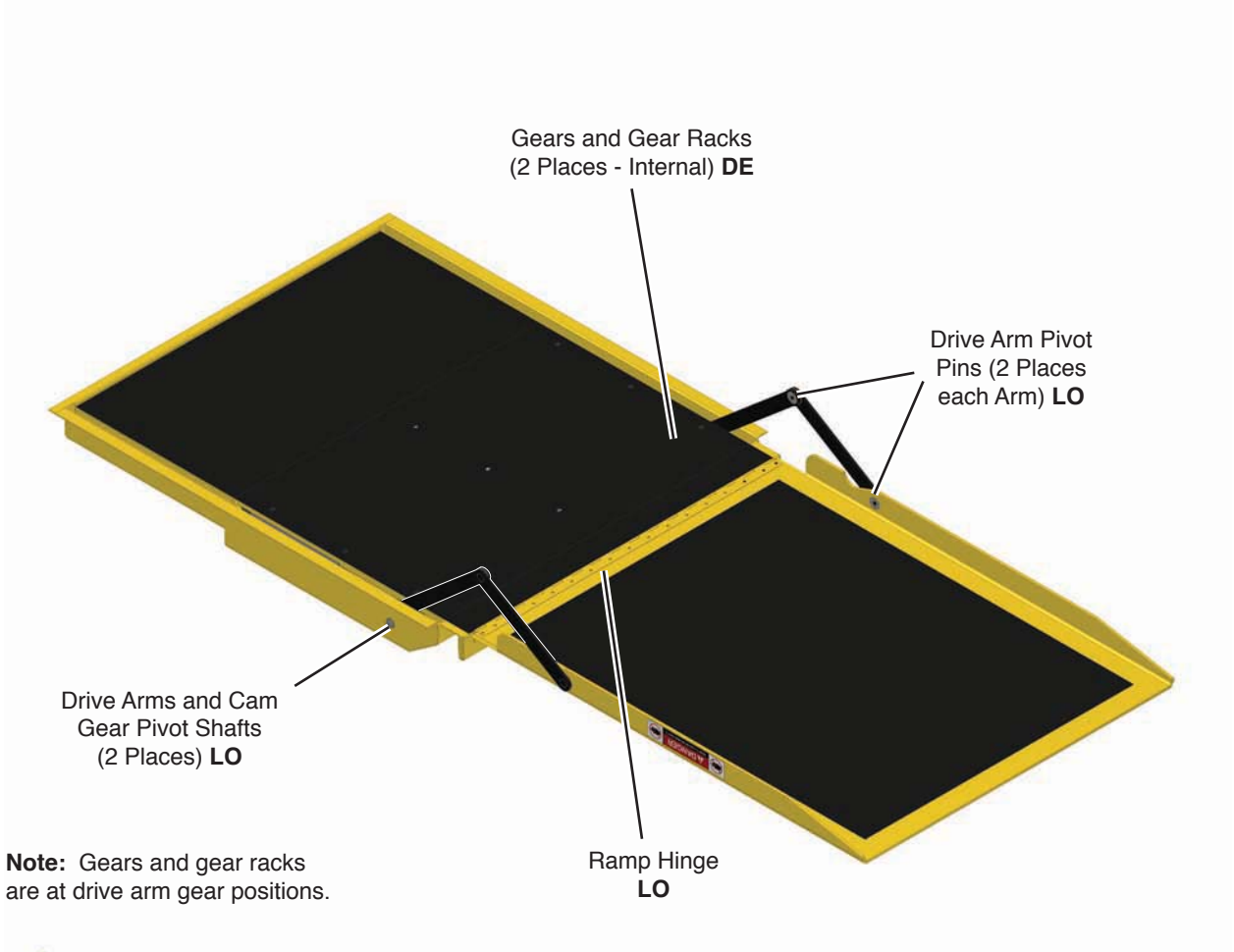


Figure H

Lubrication Diagram

See the Maintenance/Lubrication Schedule for recommended applications per number of cycles or elapsed time.



Note: Gears and gear racks are at drive arm gear positions.

Lubricant	Type	Specified (recommended) Lubricant	Available Amount	Braun Part No.
LO - Light Oil	Light Penetrating Oil (30 weight or equivalent)	LPS2, General Purpose Penetrating Oil	11 oz. Aerosol Can	15807
DE - Door-Ease	Stainless Stick Style (tube)	Door-Ease Stick (tube)	1.68 oz.	15806
LG - Light Grease	Light Grease (Multipurpose)	Lubricate	14 oz. Can	15805

Maintenance and Lubrication Introduction

Proper maintenance is necessary to ensure safe, trouble-free operation. Inspecting the ramp for any wear, damage or other abnormal conditions should be a part of all transit agencies daily service program (preventive maintenance). Simple inspections can detect potential problems.

Preventive maintenance visual inspections **do not** take the place of the procedures specified in this schedule.

The maintenance and lubrication procedures specified in this schedule **must** be performed by a Braun authorized service representative at the scheduled intervals according to the number of cycles or elapsed time, whichever comes first.

RA400 Ramps are equipped with hardened pins and self-lubricating bearings to decrease wear, provide smooth operation and extend the service life of the ramp.

Clean the components and the surrounding area **before applying lubricants**. LPS2 General Purpose Penetrating Oil is recommended where Light Oil is called out. Use of improper lubricants can attract dirt or other contaminants which could result in wear or damage to the components. Ramp components exposed to contaminants when lowered to the ground may require extra attention. Specified lubricants are available from The Braun Corporation (part numbers provided on page 20).

Recommended Intervals: These intervals are a general guideline for scheduling maintenance procedures and will vary according to ramp use and conditions. Transit agencies operating vehicles equipped with ramps that are not monitored by cycles may choose to have the ramp system maintained on the same schedule as the vehicle (routine maintenance). Doing so ensures the ramp is being maintained regularly.

⚠WARNING

Maintenance and lubrication procedures must be performed as specified by an authorized service technician.
Failure to do so may result in serious bodily injury and/or property damage.

When servicing the ramp at the consecutive recommended intervals, inspection and lubrication procedures specified in the previous sections should be performed (repeated). **All** listed inspection, lubrication and maintenance procedures should be repeated at “8 Weeks or 200 Cycles” intervals following the scheduled “1 Year or 1250 Cycles” maintenance.

Lifts exposed to severe conditions (weather, environment, contamination, heavy usage, etc.) may require inspection and maintenance procedures to be performed more often than specified.

Discontinue ramp use immediately if maintenance and lubrication procedures are not properly performed, or if there is any sign of wear, damage or improper operation. Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect your ramp.

Maintenance and Lubrication Schedule

8 Weeks or 200 Cycles	Ramp hinge	Clean and lubricate. Apply Light Oil - See Lubrication Diagram
	Drive arm pivot pins (screws, nuts and bearings)	Apply Light Oil - See Lubrication Diagram
	Drive arm and cam gear pivot shaft	Apply Light Oil - See Lubrication Diagram

continued

continued		
8 Weeks or 200 Cycles	Inspect drive arm pivot points (mounting screws, nuts and bearings) for positive securement, wear or damage	Tighten, replace or correct as needed.
	Clean ramp and ramp mounting area (ensure no debris in area to obstruct stowing/stacking)	Clean and remove debris or obstructions
	Cycle ramp and observe drift speed during deploy and stow functions	If drifts too fast, adjust applicable Drift Microswitch Cam so drift begins at reduced height.
	Inspect ramp for wear, damage or any abnormal condition.	Correct as needed

1 Year or 1250 Cycles	**Perform all procedures listed in previous section also**	
	Remove sub floor (pan cover) and clean dirt and other foreign debris	Blow out with air compressor
	Remove sub floor (pan cover) and lubricate drive arm gear and cylinder gear rack	Clean and lubricate. Apply Door-Ease
	Remove sub floor (pan cover) and inspect:	
	• Pump mounting bolts for securement (loose or missing)	Resecure, adjust microswitches, replace damaged parts or otherwise correct as needed.
	• Drive arm and gear rack weldment teeth for foreign objects, wear or damage (bent, deformed, misaligned), positive securement and proper operation	
	• Gear rack weldment pin securement E-clip (loose or missing)	
	• Hydraulic cylinder, hoses, fittings and connections for wear, damage or leaks	
	• Harness cables, wires, terminals and connections for securement or damage	
	• Relays for securement or damage	
	• Microswitches and cams for securement and adjustment	
	• Microswitch wires and terminals for securement or damage	

continued **1 Year or 1250 Cycles**	Hydraulic Fluid (Pump) - Check level. **Note:** Fluid should be changed if there is visible contamination. Inspect the hydraulic system (cylinder, hoses, fittings, seals, etc.) for leaks if fluid level is low.	Use Braun 32840-QT (Exxon® Univis HVI 26) hydraulic fluid (**do not mix** with Dextron III or other hydraulic fluids). Check fluid level with **ramp deployed fully**. Fill to within 1/2" of the bottom of the 1-1/2" fill tube (neck).
	Inspect vehicle-to-ramp wiring harness	Resecure, repair or replace or otherwise correct as needed
	Mounting	Check to see that the ramp is securely anchored to the vehicle and there are no loose bolts, broken welds, or stress fractures.
	Decals and Antiskid	Replace decals if worn, missing or illegible. Replace antiskid if worn or missing.

Consecutive 8 Week or 200 Cycle Intervals	**Repeat all** previously listed inspection, lubrication and maintenance procedures at 8 week or 200 cycle intervals (or per vehicle maintenance schedule).

TROUBLESHOOTING

Troubleshooting Diagnosis Chart

⚠WARNING

Troubleshooting and repair procedures must be performed as specified by an authorized service technician only. Failure to do so may result in serious bodily injury and/or property damage.

If a problem occurs with your ramp, **discontinue operation immediately!** Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect your ramp.

The cause of the problem can be determined by locating the ramp function and related symptom in the Troubleshooting Diagnosis Chart. The specific cause and remedy can then be determined by process of elimination. Wiring Diagrams, Electrical Schematics, Hydraulic Diagrams and Hydraulic Schematics are provided to aid in troubleshooting.

A Repair Parts section with an exploded view and corresponding parts list is also provided. Correct the problem if possible. If the problem continues, contact The Braun Corporation.

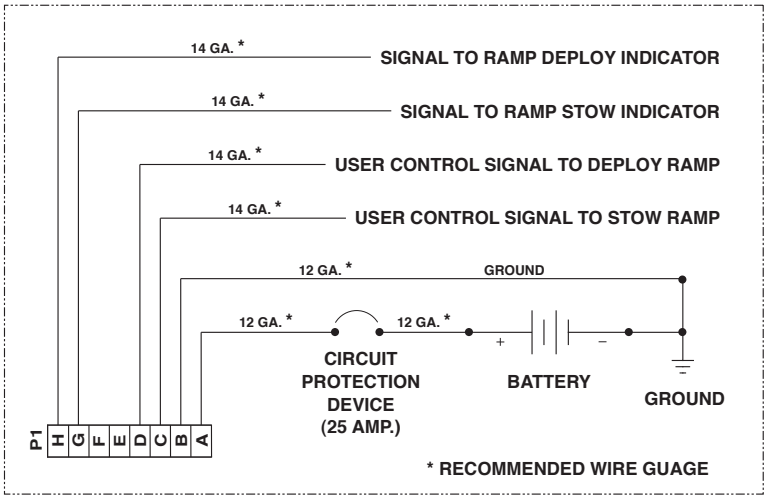
FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
1.00 NO OPERATION	**1.10 No Power To Ramp (Circuit Problem)**	1.11 Battery terminals dirty	Clean and tighten
		1.12 Chassis ground connection (frame ground cables)	Clean and tighten. See **Chassis Ground Corrosion** on page 18.
		1.13 Battery damaged	Replace
		1.14 Battery discharged	Charge battery
		1.15 In-line fuse faulty	Replace fuse
		1.16 Power cable	Check for loose terminals or broken wire
		1.17 Vehicle Interlock(s) circuit incomplete	Correct or replace
		1.18 Vehicle-to-ramp wiring harness	Disconnect harness from ramp. Using volt meter, test (probe) 12-pin connector terminals.
	1.20 Power to Ramp But No Pump Operation	1.21 Ramp wiring harness	Remove relays from sockets. Using volt meter, test (probe) wires/terminals at relay sockets.
		1.22 Faulty relay(s)	Replace
		1.22 Loose connection(s)	Clean and tighten
		1.24 Broken wire(s)	Repair
		1.25 Wire terminal(s)	Crimp tightly to wire

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
2.00 DEPLOY (Out)	**2.10 No Operation**	2.11 See 1.00 2.12 Drift Out Microswitch out of adjustment or damaged 2.13 Drift Out Microswitch harness disconnected, damaged or otherwise damaged 2.14 Pump motor brushes worn	 See Microswitches in Systems Descriptions for details Connect, repair or replace Contact Braun Product Support - replace pump
	2.20 Locked in Intermediate Position (No Response to Deploy Switch/No Drift Out)	2.21 Ramp was stopped within the Deploy "Drift Out" range during Stow function	Activate Stow function until ramp is out of the Deploy "Drift Out" range. Then activate Deploy function.
	2.30 Pump Runs But Doesn't Deploy	2.31 Physical obstruction (20 lb or more) on ramp 2.32 Mechanical binding 2.33 Deploy pressure relief valve setting too low 2.34 Low hydraulic fluid supply. **Note:** Fluid should be changed if there is visible contamination. Inspect the hydraulic system for leaks if fluid level is low. 2.35 Leak in hydraulic system 2.36 Cylinder leak 2.37 Deploy pressure relief valve stuck open due to contamination or otherwise damaged 2.38 Pump internal shuttle valve stuck or damaged	Remove obstruction Check and correct Adjust relief valve setting. Use Braun 32840-QT (Exxon® Univis HVI 26) hydraulic fluid (**do not mix** with Dextron III or other hydraulic fluids). Check oil level with **ramp fully deployed**. Repair Replace. Contact Braun Product Support - replace pump Contact Braun Product Support - replace pump
	2.40 Faulty or Sluggish Operation	2.41 Lack of lubrication (drive arm assembly pivot pins and shaft) 2.42 Misalignment or damage to: • Drive arm and/or pivot pins • Linkage arms and/or pivot pins • Drive arm and cam gear shaft • Cylinder rack gear and/or cam gear 2.43 Mechanical binding 2.44 Restriction in hydraulic lines	Lubricate pivot pins. See Maintenance and Lubrication Schedule and Diagram Correct/Replace/Lubricate. See Maintenance and Lubrication Schedule and Diagram Check and correct Check for contamination or kinks - correct or replace
	2.50 Drifts Excessively Slow (or No Drift)	2.51 See 2.38 and 2.40 2.52 Pump internal orifice plugged or damaged 2.53 Drift Out Cam needs adjustment	 Contact Braun Product Support - replace pump Adjust Drift Cam
	2.60 Drifts Excessively Fast	2.61 See 2.35, 2.36 and 2.53 2.62 Pump internal orifice enlarged or damaged 2.64 Drift Out cam needs adjustment	 Contact Braun Product Support - replace pump Adjust Drift Cam

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
3.00 STOW (In)	3.10 No Operation	3.11 See 1.00 3.12 Drift In Microswitch out of adjustment or damaged 3.13 Drift In Microswitch harness disconnected, damaged or otherwise damaged	 Adjust or replace. Connect, repair or replace
	3.20 Locked in Intermediate Position (No Response to Stow Switch/No Drift In)	3.21 Ramp was stopped within the Stow "Drift In" range during Deploy function	Activate Deploy function until ramp is out of the Stow "Drift In" range. Then activate Stow function.
	3.40 Pump Runs But Doesn't Stow	3.41 See 2.31, 2.32, 2.34, 2.35, 2.36 and 2.38 3.42 Stow pressure relief valve setting too low 3.43 Stow pressure relief valve stuck open due to contamination or otherwise damaged	 Adjust relief valve setting. Contact Braun Product Support - replace pump
	3.50 Faulty or Sluggish Operation	4.51 See 2.40	
	3.60 Drifts Excessively Slow (or No Drift)	4.61 See 2.40 and 2.52 4.62 Drift In Cam needs adjustment	 Adjust Drift Cam
	3.70 Drifts Excessively Fast	4.71 See 2.35, 2.36, 2.62 and 4.62	

Electrical Schematic - FF3248Y-24V

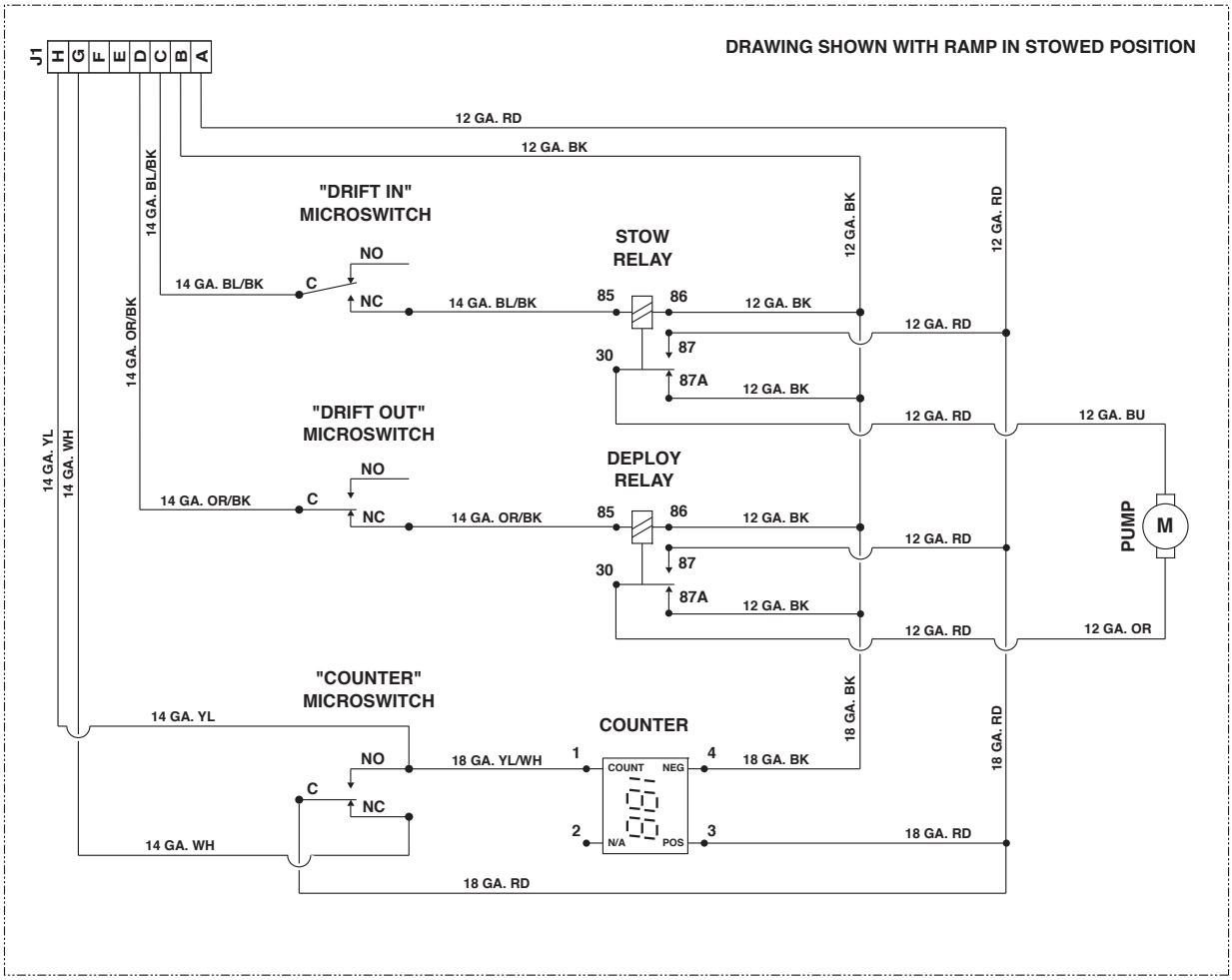
POWER CONNECTIONS / CONTROL SIGNALS (PROVIDED BY INSTALLER)



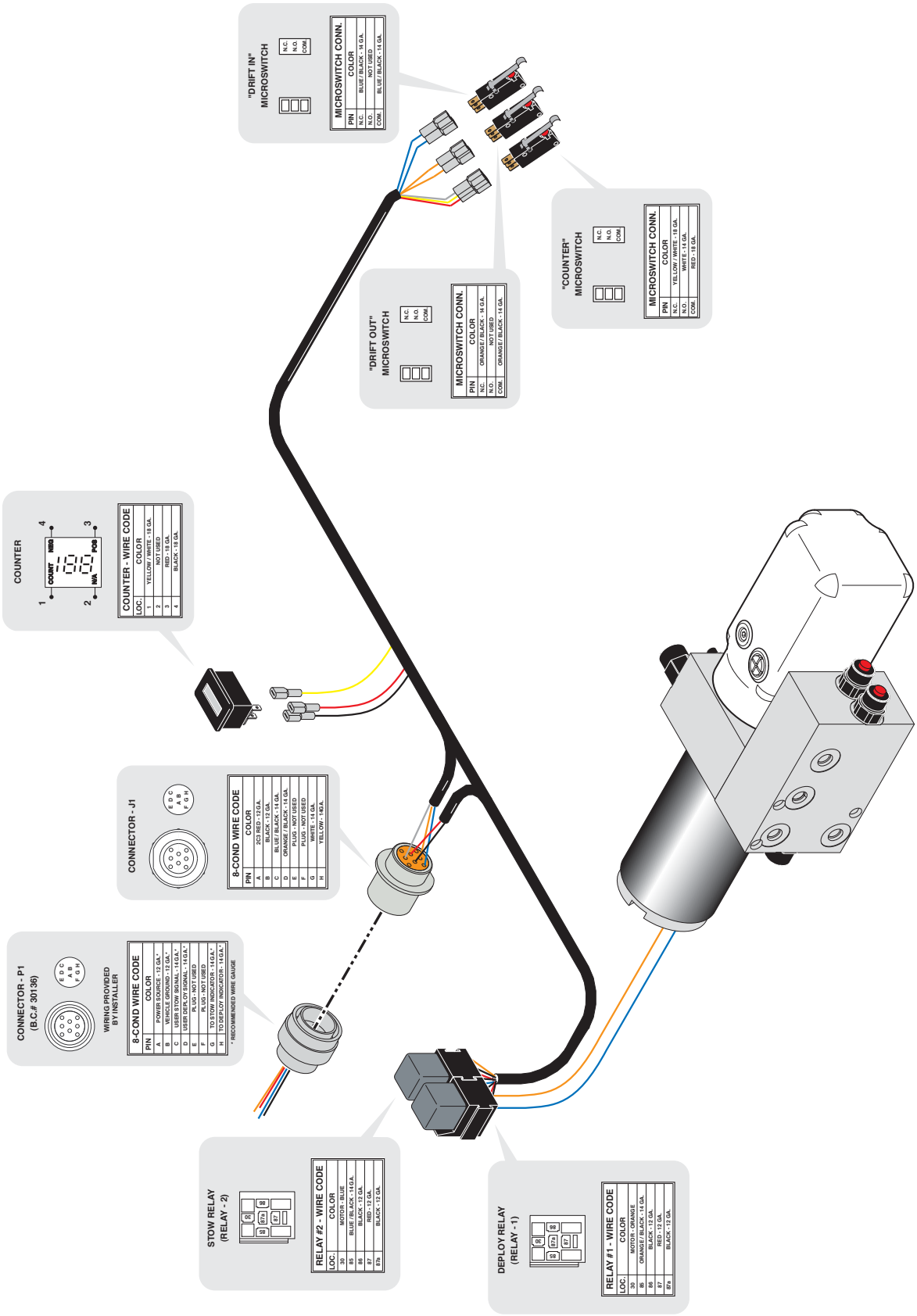
SYMBOL KEY

DESCRIPTION	SYMBOL
BATTERY	
CHASSIS GROUND	
CIRCUIT PROTECTION DEVICE	
JUNCTION	
MICROSWITCH	
RELAY	
MOTOR	
COUNTER	

RA400 TRANSIT RAMP ASSEMBLY



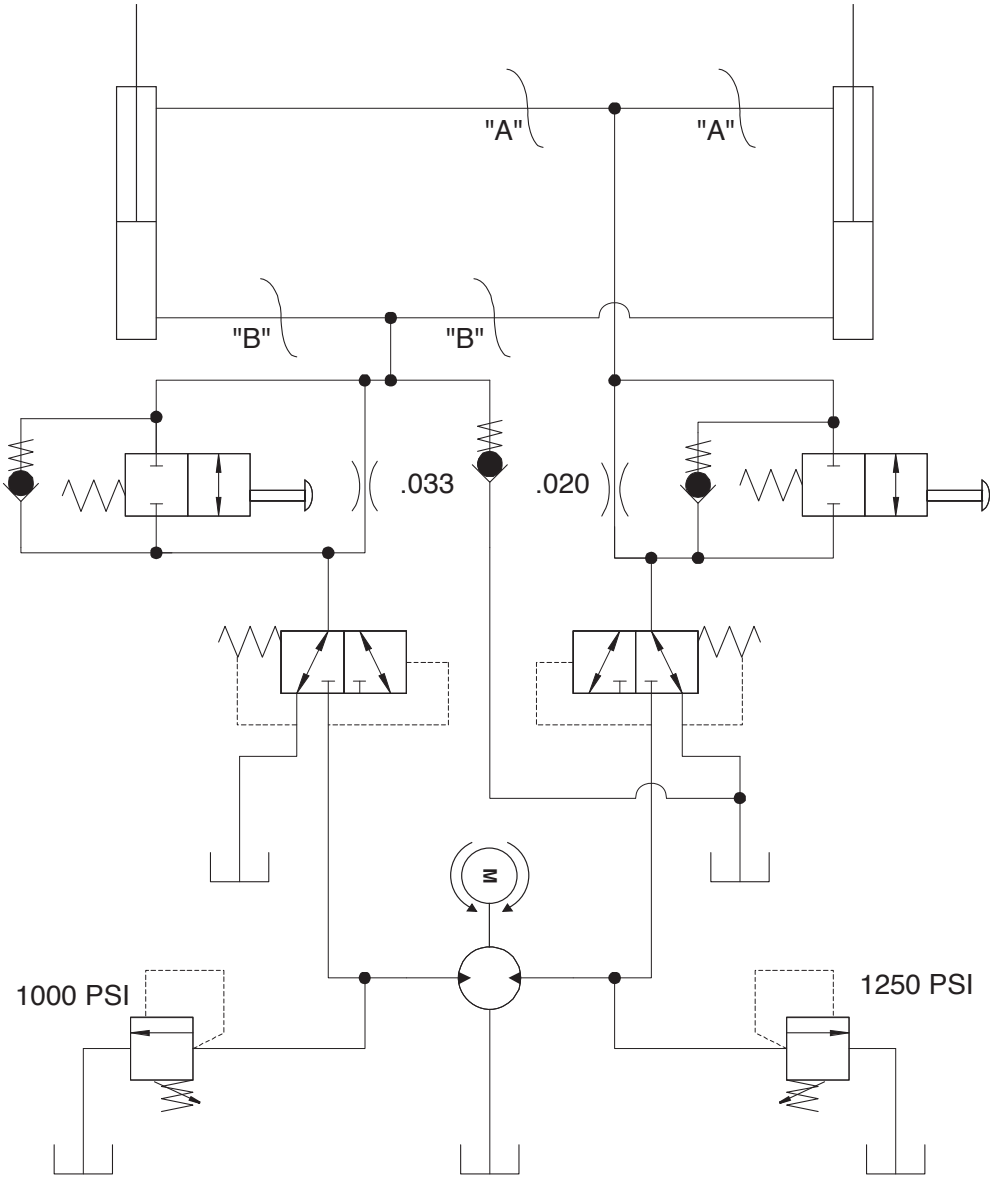
Wiring Diagram - FF3248Y-24V


"DRIFT IN" MICROSWITCH
N.C.
N.O.
COM.
MICROSWITCH CONN.
PIN | COLOR
N.C. | BLUE / BLACK - 14 GA.
N.O. | NOT USED
COM. | BLUE / BLACK - 14 GA.
"DRIFT OUT" MICROSWITCH
MICROSWITCH CONN.
PIN | COLOR
N.C. | ORANGE / BLACK - 14 GA.
N.O. | NOT USED
COM. | ORANGE / BLACK - 14 GA.
"COUNTER" MICROSWITCH
MICROSWITCH CONN.
PIN | COLOR
N.C. | YELLOW / WHITE - 18 GA.
N.O. | WHITE - 14 GA.
COM. | RED - 18 GA.
COUNTER
COUNT
RESET
POWER
MAN
COUNTER - WIRE CODE
LOC. | COLOR
1 | YELLOW / WHITE - 18 GA.
2 | NOT USED
3 | RED - 18 GA.
4 | BLACK - 18 GA.
CONNECTOR - J1
8-COND WIRE CODE
PIN | COLOR
A | 2C3 RED - 12 GA.
B | BLACK - 12 GA.
C | BLUE / BLACK - 14 GA.
D | ORANGE / BLACK - 14 GA.
E | PLUG - NOT USED
F | PLUG - NOT USED
G | WHITE - 14 GA.
H | YELLOW - 14GA.
CONNECTOR - P1
(B.C.# 30136)
WIRING PROVIDED BY INSTALLER
8-COND WIRE CODE
PIN | COLOR
A | POWER SOURCE - 12 GA.*
B | VEHICLE GROUND - 12 GA.*
C | GRIB STOW SIGNAL - 14 GA.*
D | GRIB RETRACT SIGNAL - 14 GA.*
E | PLUG - NOT USED
F | PLUG - NOT USED
G | TO STOW INDICATOR - 14 GA.*
H | TO DEPLOY INDICATOR - 14 GA.*
* RECOMMENDED WIRE GAUGE
STOW RELAY (RELAY - 2)
RELAY #2 - WIRE CODE
LOC. | COLOR
30 | MOTOR - BLUE
85 | BLUE / BLACK - 14 GA.
86 | BLACK - 14 GA.
87 | RED - 12 GA.
87A | BLACK - 12 GA.
DEPLOY RELAY (RELAY - 1)
RELAY #1 - WIRE CODE
LOC. | COLOR
30 | MOTOR - ORANGE
85 | ORANGE / BLACK - 14 GA.
86 | BLACK - 14 GA.
87 | RED - 12 GA.
87a | BLACK - 12 GA.

Hydraulic Schematic - FF3248Y-24V

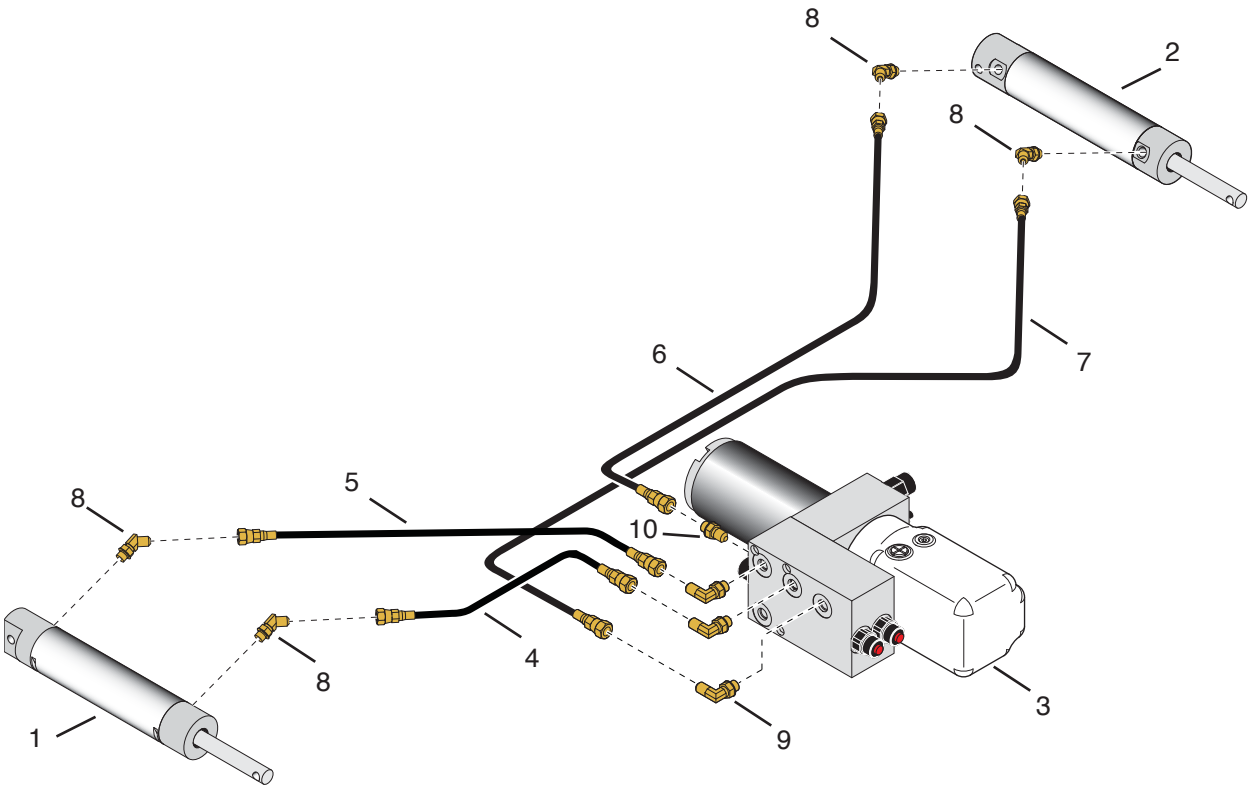
Description	Symbol
Pump, Bidirectional Displacement	
Pump Motor, Bidirectional	
Flow Control Valve	
Fixed Orifice	
3 Way 2 Position Shuttle Valve	

Cylinder, Double Acting	
Relief Valve	
Check Valve	
Hydraulic Port	
Filter Screen	
Reservoir, Vented	



Hydraulic Diagram and Parts List - FF3248Y-24V

Item	Qty.	Description	FF3248Y-24V
1	1	CYLINDER - 1514.3 - COMPACT	C1514.3-9800
2	1	CYLINDER - 1514.3 - COMPACT	C1514.3-9900
3	1	PUMP - POWER UNIT - 24V HYDRAULIC - COMPACT	30775-24V
4	1	HOSE ASSEMBLY - 5.5" - 1/8" DIA - SW/SW	16004A-005.5
5	1	HOSE ASSEMBLY - 9" - 1/8" DIA - SW/SW	16004A-009
6	1	HOSE ASSEMBLY - 26" - 1/8" DIA - SW/SW	16004A-026
7	1	HOSE ASSEMBLY - 30" - 1/8" DIA - SW/SW	16004A-030
8	4	ELBOW - 7/16-20 M/O-RING/45*	24505
9	3	ELBOW - 7/16-20 M/O-RING/37*	25085
10	1	FITTING - 7 /16-20 - 7/16-20 - 37*	24504

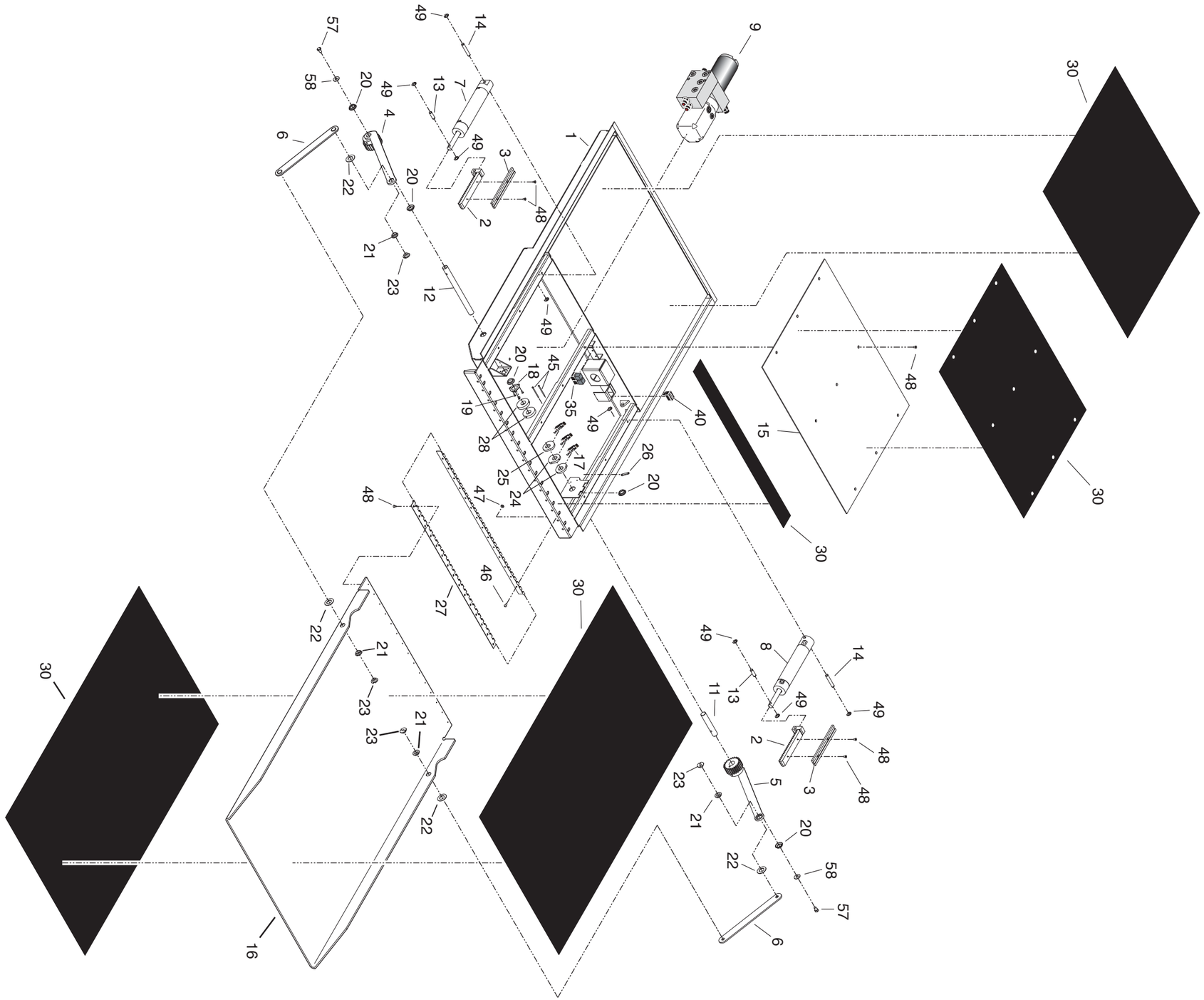


REPAIR PARTS

Item	Qty.	Description	FF3248Y-24V
1	1	RA400 MAIN PAN WMT.	RA40444WY-48
2	2	GEAR RACK WELDMENT	RA40402WBKN
3	2	BEARING STRIP	RA40105
4	1	MAIN DRIVE ARM WELDMENT	RA40401LWBKN
5	1	WMT-MAIN DRIVE ARM/RIGHT	RA40401RWBKN
6	2	FOLD LINK WELDMENT	RA40050WBKN
7	1	CYLINDER-1514.3-COMPACT CYL.	C1514.3-9800
8	1	CYLINDER-1514.3-COMPACT CYL.	C1514.3-9900
9	1	PUMP-POWER UNIT-24V HYDRAULIC/ COMPACT	30775-24V
10*	1	PLATE-HINGE SUPPORT	BF00013Y
11	1	SHAFT-MAIN PIVOT	RA40101
12	1	SHAFT-MAIN PIVOT-RA400/02	RA40501
13	2	CYLINDER/RACK PIN	RA40002
14	2	PIN-CYLINDER MOUNT	BF00067
15	1	SUB-FLOOR/COVER	RA40003Y
16	1	RAMP PLATFORM/STAGE 1	RA43248Y
17	3	MICROSWITCH-SEALED	30205
18	1	PLATE-BEARING RETAINER	RA40505Y
19	3	RIVET-1/8" DIA X .188-.250 SS	84249
20	4	BEARING-FLANGE-3/4" X 1/4"-12FDU04	24012
21	4	BEARING-FLANGED-5/8" SHAFT	29754
22	4	BEARING-THRUST-3/4" SHAFT	29755
23	4	NUT-PIVOT-7/16-20, FOLD-N-RAMP	29756
24	2	CAM-MICRO-SWITCH ADJUST-BI FOLD	BF00076
25	1	CAM-MICRO SWITCH ADJUST	RA40506
26	1	PLATE-TAPPED #4-40 MICRO SWITCH	24998
27	1	HINGE-2" X 31"-SS WITH PEM NUTS/1 ROW	29960PS-1Y
28	2	CAM-MANUAL VALVE-RA400/02	RA40500
29*	2	SCREW-1/4-20 X 1/4 SET CUP PT	11563
30	**	TAPE-ANTISKID-36" WIDE ROLL	28621R **
31*	1	HOSE ASSEMBLY 5.5"-1/8" DIA. SW./SW. (See Hyraulics)	16004A-005.5
32*	1	HOSE ASSEMBLY 9"-1/8" DIA. SW./SW. (See Hyraulics)	16004A-009
33*	1	HOSE ASSEMBLY 30"-1/8" DIA. SW./SW. (See Hyraulics)	16004A-030
34*	1	HOSE ASSEMBLY 26"-1/8" DIA. SW./SW. (See Hyraulics)	16004A-026
35	2	RELAY-30/40A/SPDT/24V/PLUG-IN	15033
36*	2	TERM-12/16-F.SPD-1/4-TAB	13237
37*	1	HARN-MAIN ASSY	RA40001A
38*	1	NUT-PANEL- DT 114020-90	30030
39*	1	WASHER-LOCK- DT 114021	30031
40	1	CYCLE COUNTER-LCD WITHOUT RESET	30547
41*	3	BOLT-3/8-16 X 1/2" 316SS HEX	BF00249
42*	1	SERIAL TAG DECAL ASSEMBLY	34048A
43*	2	DECAL-DANGER KEEP CLEAR	81819
44*	2	SCREW-#10-32 X 5/16" SET/AUTO-BK	11562
45	2	SCREW-#4-40 X 1 1/2" RD. HD.	11485
46	19	SCREW-#10-32X1/2 BHSCS/AUTO BLACK	30375
47	18	NUT-#10-32 W/LOCKWASHER/AUTO-BK	18349
48	30	SCREW-#10-32X3/8 FL HD-HX SKT/AUTO-BK	24537
49	8	E CLIP-3/8 SHAFT	84383
50*	2	NUT-1/4-20 NYLOCK/AUTO-BK	14614
51*	2	BOLT-1/4-20 X 2 1/2" HEX	10004
52*	**	FLUID-HYDRAULIC EXXON UNIVIS HVI 26 (See Systems Descriptions)	32840R**
53*	1	NYLON LOOP-MANUAL BACKUP	RA40507
54*	1	WASHER-#10 FLAT/AUTO-BK	11541
55*	1	FITTING-7/16-20/7/16-20/37* (See Hyraulics)	24504
56*	2	SPACER-HANDRAIL-.230 T/UHMW	911-5301
57	2	BOLT-5/16-18 X 1/2" 316 SS HEX	BF00251
58	2	WASHER-5/16 FLAT	10063
59*	3	ELBOW-45*-7/16-20+7/16-20 SAE MALE O-RNG (See Hyraulics)	24505
60*	4	ELBOW-7/16-20 M/O-RNG/37* (See Hyraulics)	25085

* ITEM NOT SHOWN IN EXPLODED VIEW

** RAW MATERIAL ITEMS ORDERED AND PRICED PER LENGTH (ORDER REQUIRED LENGTH)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Unfold for:
RA400 Ramp
Exploded View

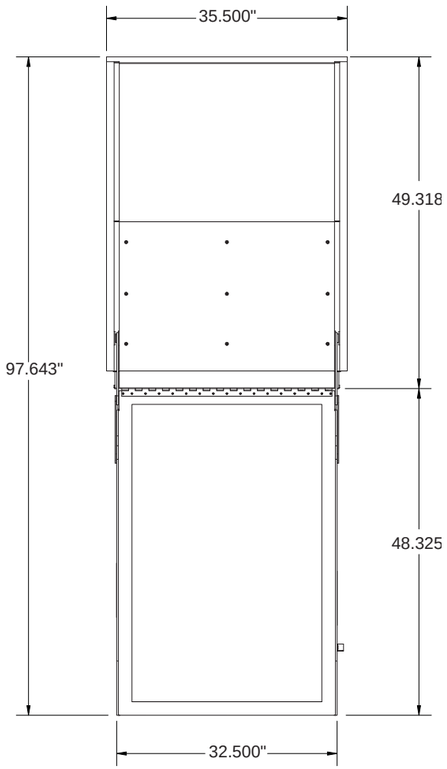
SPECIFICATION AND DIMENSIONS

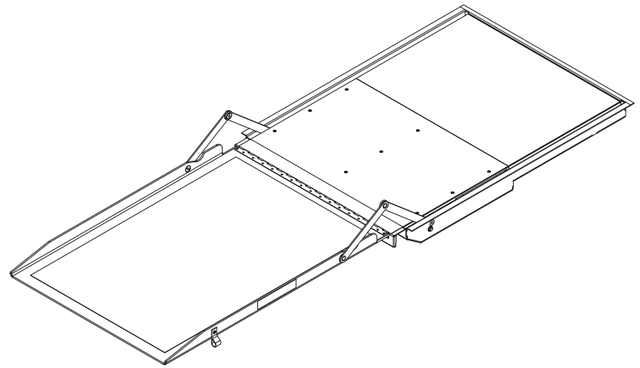
Power Unit: Hydraulic Pump Module

Voltage: 24 VDC

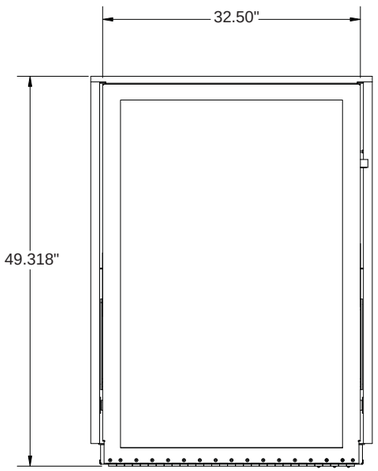
Notes: Mounting holes/brackets per application

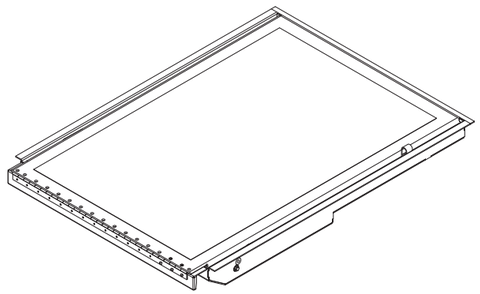
Deployed View

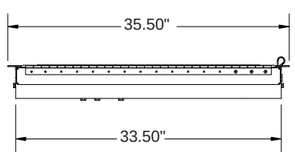


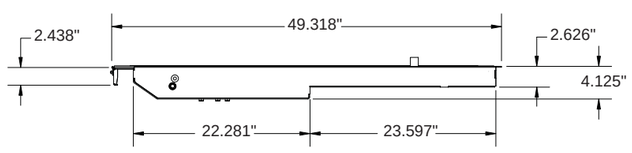


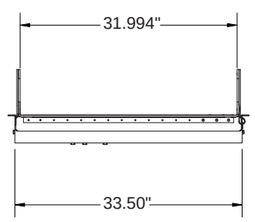
Stowed View

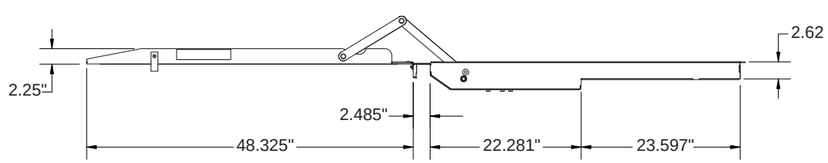












Note: All dimensions are approximate.

BRAUN® LIMITED WARRANTY

WARRANTY COVERAGE AND WARRANTY COVERAGE TIME PERIODS

The Braun Corporation ("Braun") warranty covers certain parts of this wheelchair lift for three (3) years or 10,000 cycles and the cost of labor to repair or replace those parts for one (1) year or 3,000 cycles. This limited warranty covers substantial defects in materials and workmanship of the lift, provided that the lift is operated and maintained properly and in conformity with the owner's manual. The warranty period begins on the date that the product is delivered to the first retail purchaser by an independent, authorized dealer of Braun, or, if the dealer places the product into any type of service prior to retail sale, on the date the dealer first places the product in such service. This limited warranty applies only to the first purchaser. It may not be transferred.

WHAT BRAUN WILL DO TO CORRECT PROBLEMS

In the event that a substantial defect in material or workmanship, attributable to Braun, is found to exist during the first year of warranty coverage, it will be repaired or replaced, at Braun's option, without charge for parts or labor to the owner, in accordance with the terms, conditions and limitations of this limited warranty. If the substantial defect in material or workmanship, attributable to Braun, is found to exist during the second or third year of warranty coverage, it will be repaired or replaced, at Braun's option, without charge to the owner for parts, only, in accordance with the terms, conditions and limitations of this limited warranty. The cost of labor for any repair or replacement in the second and third year of warranty coverage is the sole responsibility of the owner. This warranty does not cover labor costs in the second or third year of coverage.

Braun's obligation to repair or replace defective materials or workmanship is the sole obligation of Braun under this limited warranty. Braun reserves the right to use new or remanufactured parts of similar quality to complete any work, and to make parts and design changes from time to time without notice to anyone. Braun reserves the right to make changes in the design or material of its products without incurring any obligation to incorporate such changes in any previously manufactured product. Braun makes no warranty as to the future performance of this product, and this limited warranty is not intended to extend to the future performance of the product. In addition, the owner's obligation to notify Braun, or one of its authorized, independent dealers, of a claimed defect does not modify any obligation placed on the owner to contact Braun directly when attempting to pursue remedies under state or federal law.

LIMITATIONS, EXCLUSIONS AND DISCLAIMER OF IMPLIED WARRANTIES

ANY IMPLIED WARRANTY THAT IS FOUND TO ARISE BY WAY OF STATE OR FEDERAL LAW, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR ANY IMPLIED WARRANTY OF FITNESS, IS LIMITED IN DURATION TO THE TERMS OF THIS LIMITED WARRANTY AND IS LIMITED IN SCOPE OF COVERAGE TO THE SCOPE OF COVERAGE OF THIS LIMITED WARRANTY. Braun disclaims any express or implied warranty, including any implied warranty of fitness or merchantability, on items excluded from coverage as set forth in this limited warranty. Braun makes no warranty of any nature beyond that contained in this limited warranty. No one has authority to enlarge, amend or modify this limited warranty, and Braun does not authorize anyone to create any other obligation for it regarding this product. Braun is not responsible for any representation, promise or warranty made by any independent dealer or other person beyond what is expressly stated in this limited warranty. Any selling or servicing dealer is not Braun's agent, but an independent entity.

BRAUN SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES THAT MAY RESULT FROM BREACH OF THIS LIMITED WARRANTY OR ANY IMPLIED WARRANTY. THIS EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES SHALL BE INDEPENDENT OF ANY FAILURE OF THE ESSENTIAL PURPOSE OF ANY WARRANTY, AND THIS EXCLUSION SHALL SURVIVE ANY DETERMINATION THAT THIS LIMITED WARRANTY OR ANY IMPLIED WARRANTY HAS FAILED OF ITS ESSENTIAL PURPOSE. This warranty does not cover, and in no event shall Braun be liable for towing charges, travel, lodging, or any other expense incurred due to the loss of use of the product or other reason.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

HOW TO GET SERVICE

To obtain warranty service the owner must do all of the following:

1. Notify an authorized service center, of the claimed defect attributable to Braun, within the warranty coverage period designated above.
2. Provide the notification mentioned in (1), above, within ten (10) days of when the owner discovered, or should have discovered, the claimed defect.
3. Promptly schedule an appointment with and take the product to an authorized service center for service.
4. Pay any transportation costs and all expenses associated with obtaining warranty service.

Since Braun does not control the scheduling of service work at the independent dealerships you may encounter some delay in scheduling or completion of work. If you need assistance you may contact Braun, at 631 West 11th Street, Winamac, Indiana 46996; 1-800-THE-LIFT, (843-5438).

If two (2) or more service attempts have been made to correct any covered defect that you believe impairs the value, use or safety of the product, or if it has taken longer than thirty (30) days for repairs to be completed, you must, to the extent permitted by law, notify Braun directly, in writing, at the above address, of the unsuccessful repair(s) of the alleged defect(s) so that Braun can become directly involved in providing service pursuant to the terms of this limited warranty.

WHAT IS NOT COVERED

This Limited Warranty does not cover any of the following: defects in materials, components or parts of the product not attributable to Braun, any material, component or part of the product that is warranted by another entity (Note: the written warranty provided by the manufacturer of the material, component or part is the direct responsibility of that manufacturer); items that are added or changed after the product leaves Braun's possession; additional items installed at any dealership, or other place of business, or by any other party, other than Braun; normal wear, tear, usage, maintenance, service, periodic adjustments, the effects of condensation or moisture from condensation; mold or any damage caused by mold; imperfections that do not affect the product for its intended purpose; items that are working as designed but that you are unhappy with; problems related to misuse, mishandling, neglect or abuse, including failure to maintain the product in accordance with the owner's manual, or other routine maintenance such as inspections, lubricating, adjustments, tightening of screws, sealing, wheel alignments or rotating tires; damage due to accident or collision, including any acts of weather or damage or corrosion due to the environment; theft, vandalism, fire, or other intervening acts not attributable to Braun; damage resulting from tire wear or tire failure; defacing, scratches, dents or chips on any interior or exterior surface of the product, including those caused by rocks or other road hazards, damage caused by off road use, overloading or alteration of the product, or any of its components or parts.

Defects and/or damage to interior and exterior surfaces and other appearance items may occur at the factory or when the product is in transit. These items are usually detected and corrected at the factory or by a dealer prior to delivery to the purchaser. You must inspect the product for this type of damage when you take delivery. If you find any such defect or damage you must notify the selling dealer, or Braun, at the time of delivery to have these items covered by this limited warranty and to have work performed on the items at no cost to you as provided by this limited warranty.

EVENTS DISCHARGING BRAUN FROM OBLIGATION UNDER WARRANTY

The following shall completely discharge Braun from any express or implied warranty obligation to repair or replace anything and void this warranty: misuse, neglect, collision, accidents, failure to provide routine maintenance (See Owner's Manual), unauthorized alteration, off road use, Acts of Nature, damage from weather or the environment, theft, vandalism, tampering, fire, explosions, overloading the product and odometer tampering.

LEGAL REMEDIES

Any action to enforce any portion of this limited warranty, or any implied warranty, must be commenced within six (6) months after expiration of the warranty coverage period designated above or the action will be barred because of the passage of time. Any performance of repairs shall not suspend this limitation period from expiring. Any performance of repairs after the warranty coverage period has expired, or performance of repairs regarding any thing excluded from coverage under this limited warranty shall be considered "good will" repairs, and they will not alter the terms of this limited warranty, or extend the warranty coverage period or the filing limitation period in this paragraph. In addition, since it is reasonable to expect that the product will need some service during the warranty period, this warranty does not extend to future performance. It only sets forth what Braun will do and does not guarantee anything about the product for any time period. Nothing in this warranty, or any action of Braun, or any agent of Braun, shall be interpreted as an extension of any warranty period or the filing limitation period in this paragraph. Some states do not allow a reduction in the statute of limitations, so this reduction may not apply to you.

WARRANTY REGISTRATION and MISCELLANEOUS

Your warranty registration records should be completed and delivered to the appropriate companies, including the Braun Delivery Checklist & Warranty form. That form must be returned to Braun within twenty (20) days of purchase. The Braun warranty will not be registered unless this warranty registration is completed and received by Braun. Failure to file this warranty registration with Braun will not affect your rights under this limited warranty as long as you can present proof of purchase, but it can cause delays in obtaining the benefits of this limited warranty, and it changes the start date of the warranty to the date of final assembly of the product by Braun.

Braun agrees to repair or replace any of its factory installed parts found to have substantial defects within the appropriate warranty period designated above, provided that the repair is authorized by Braun and carried out by an authorized service center (a Braun labor schedule determines the cost allowance for repairs). Braun will not honor any warranty claim for repairs or replacement of parts unless the claim is submitted with the appropriate paperwork, and the work is completed by an independent, factory authorized service center. The appropriate paperwork can be obtained by written or phone contact with Braun at the contact information in this warranty.

Braun reserves the right to designate where any warranty work can be performed. Braun also reserves the right to examine any defective workmanship or part prior to giving any authorization for warranty work. Braun's return authorization procedure must be adhered to in order to process any warranty claims.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE.

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Braun Commercial RA400 Transit Ramp

35168 November 2008

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